

CHAPTER ONE

INVENTORY

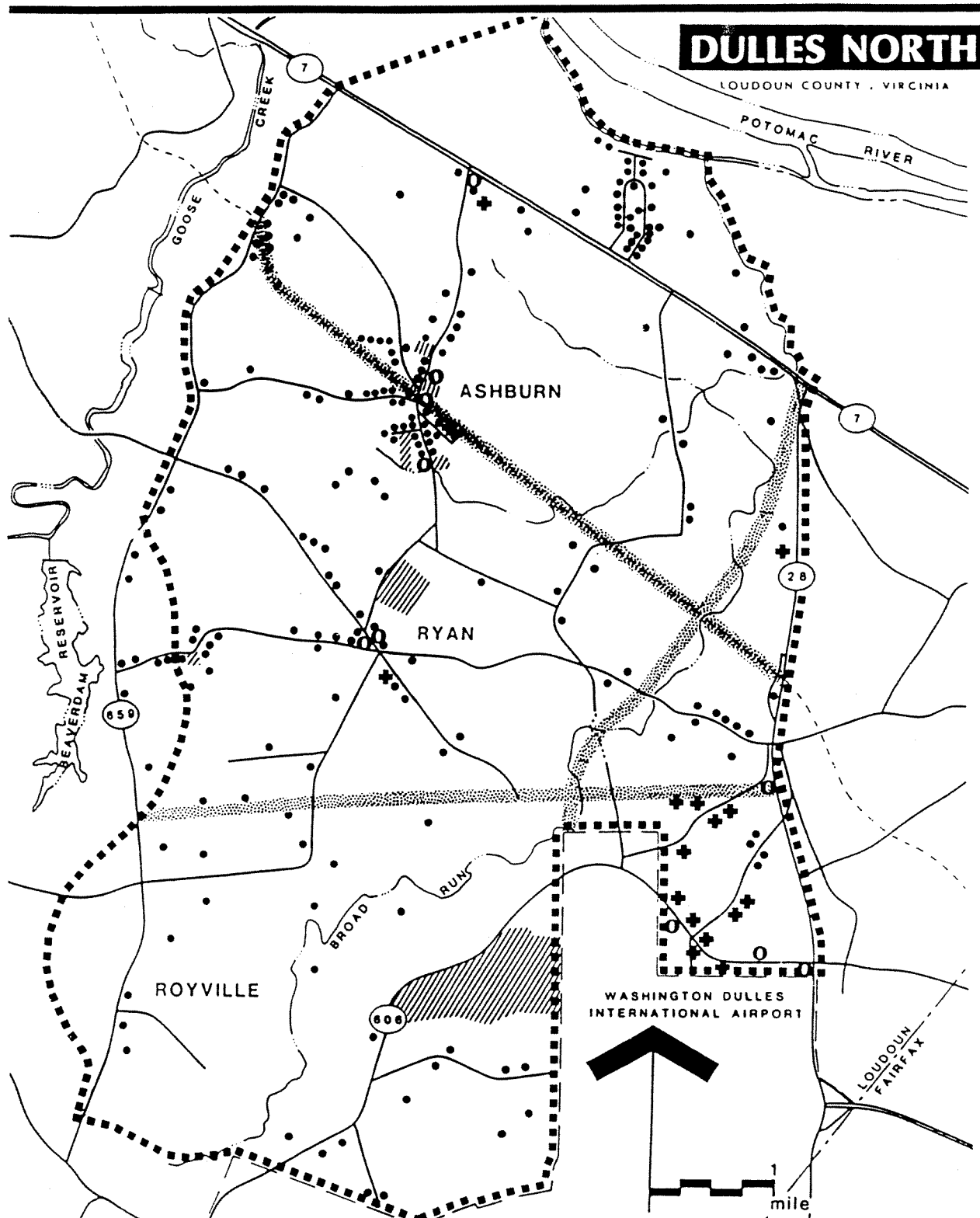
A. EXISTING LAND USES

The estimated 34 square miles or approximately 22,000 acre planning area (See *Figure 1, page 2*) finds a focus in the 19th century Village of Ashburn approximately two miles south of Route 7 where there is a concentration of some 60 dwellings and a number of local commercial and construction businesses. A secondary, largely transportation focus is in the Ryan crossroads area, which is 1.8 miles south of Ashburn and 3.3 miles west of Route 28, where there are some twenty dwelling units. Between these two focal points and surrounded by open fields is the Broad Run High School. While residences are scattered throughout the planning area at a density of 2.8 units per square mile, most of the land is open, predominantly in woodland or cultivated in corn, soy-beans or pasture, or vacant farmland. The very large acreage in institutional use noted in Table 2, page 8 represents mainly the Federal Government's Weather Research Station, 430 acres of primarily open fields adjacent to the 10,000 acre Dulles Airport. *(The airport is not included in this plan.)* School sites represent the next largest single land use category with Broad Run High School and Ashburn Elementary totaling nearly 47 acres.¹ The educational facilities on the Xerox property do not lie within the planning area but approximately 820 acres of Xerox owned open space do. Table 2, page 8, lists land uses in order to predominance while Figure 4, page 7, shows these uses in geographical terms.

Growth has been very slow in this community. Because the soil is generally unsuitable for septic systems, there has not been such a single-family residential development surge as experienced elsewhere in the County. However, with a great proportion of land in large holdings under absentee ownership, this growth may come soon. Indeed, Ashburn Village represents perhaps the first of a number of applications that may change the area greatly.²

¹ The Loudoun County School Board owns an additional 14 acres of land adjacent to the Ashburn Elementary School but is not presently using this land.

² The Ashburn Village (ZMAP #329) application consists of 1,580 acres of land extending southward from Route 7 just east of the Route 7 and 641 intersection.



EXISTING LAND USE

FIGURE 4

OCTOBER 21, 1985


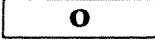





	RESIDENTIAL		COMMERCIAL
	UTILITIES		INDUSTRIAL
	PUBLIC OR SEMI-PUBLIC		AGRICULTURAL FOREST / FIELD
	PLANNING AREA BOUNDARY		

TABLE 2		
EXISTING LAND USES IN THE DULLES NORTH PLANNING AREA³		
Use	Approximate Acres	Percentage
Agriculture	12,595	58.3
Forestal/Field Succession	8,046	37.2
Institutional	483	2.2
Residential	365	1.6
Utility Lines	60	0.3
W&OD Park	37	0.2
Commercial	6	-
Churches	5	-
Industrial	4	
TOTAL	21,600	100%

B. EXISTING POPULATION

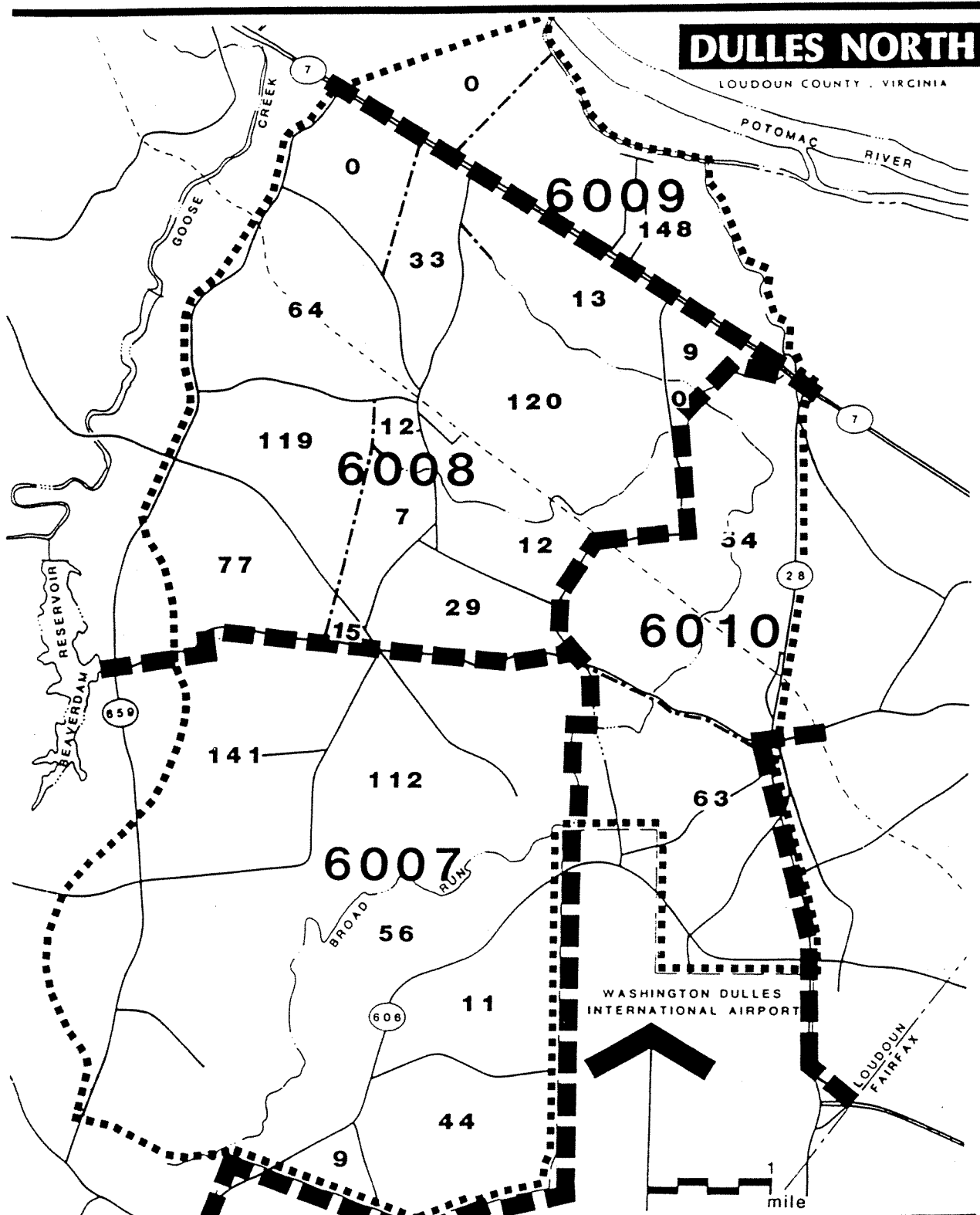
The U.S. Bureau of the Census reported that the Dulles North area, which lies within Census tracts 6007 and 6008, had a 1980 population of 1,043 persons of whom 71, or 7% were black⁴ (*overall, 8.7% of the County's population is black*). Figure 5, page 9 shows the number of persons residing in each Census block within the planning area. According to the 1980 Census, the population of this area has been scattered, relatively stable and slightly older than the Loudoun County norm. 57% of the households resided in the same dwelling units in 1975 while an additional 12% were residents of the County prior to that time.⁵ The median age of residents in the two Census Tracts was 31.6 and 31.9 years which is about two years older than the median age countywide.

In terms of children, the population of the Dulles North area resembles that of western rather than suburban eastern Loudoun. While 39% of the population in Sugarland Run and Sterling Park are below 18 years of age, only 30% of the Dulles North residents

³ Compiled by Loudoun County Department of Planning, Zoning and Community Development from aerial photography and Planimetric Maps 1979, and from Office of the Commissioner of the Revenue, Use Value Assessment Files 1981.

⁴ U.S. Census 1980

⁵ U.S. Bureau of the Census, 1980 Summary Tape File 3 Tabulation 34



CENSUS TRACTS AND POPULATION

FIGURE 5

OCTOBER 21, 1985

- 0000** CENSUS TRACT NUMBER
- CENSUS TRACT BOUNDARY
- 000** POPULATION (1980 CENSUS)
-** PLANNING AREA BOUNDARY

are below 18. 59% of the population in Census Tracts 6007 and 6008 is between 18 and 62 and the remaining 10% is more than 62 years old.⁶ The average size of households in Census Tract 6007 is 2.92 persons and that of 6008 is 3.06 persons which is very close to the County average of 3.05.⁷

The per capita and household income of persons residing in Census Tract 6008 is relatively low compared to the County average. According to the 1980 Census, median countywide household income in 1979 was \$24,434 whereas Census Tract 6008 household income was \$15,781. Census Tract 6007 reported a higher income level of \$20,553 which was still below that of the countywide average.

C. LAND OWNERSHIP

The Dulles North area has a number of very large and significant property holdings. Table 3 identifies some of the major tracts or contiguous parcels of land in the area, which are also shown on Figure 6, page 12.

TABLE 3			
MAJOR PROPERTY HOLDINGS IN THE DULLES NORTH AREA			
Holding Number	Tax Map/ Parcel	Acreage	Owner Status: Local/Absentee
1	79-35, 79-45, 79-46, 79-49, 79-49 B/C, 80-4, 80-4A, 80-5, 80-9	2,397.5	Absentee
2	62-2A	2,267.5	Local
3	62-16A, 62-24	1,154.6	Absentee
4	62-5, 62-5A, 62-7, 62-17A, 63-4C, 63-5A, 80-1, 80-2, 79-34, 63-3, 63-10, 63-11, 63-12, 63-13	2,443.9	Absentee
5	102-4, 102-5A, 93-22A, 93-20B, 93-30, 93-31, 93-33	1,203.7	Absentee
6	92-19, 92-23, 92-37A, 92-40, 93-1 78-22, 77-32	1,179.5	Local
7	62-4A; 62-5, 62-6	641.3	Absentee
8	78-55	610	Absentee
9	79-52; 79-29	538.8	Absentee

⁶ U.S. Bureau of the Census 1980 Summary Tape File 3 Tabulation 15

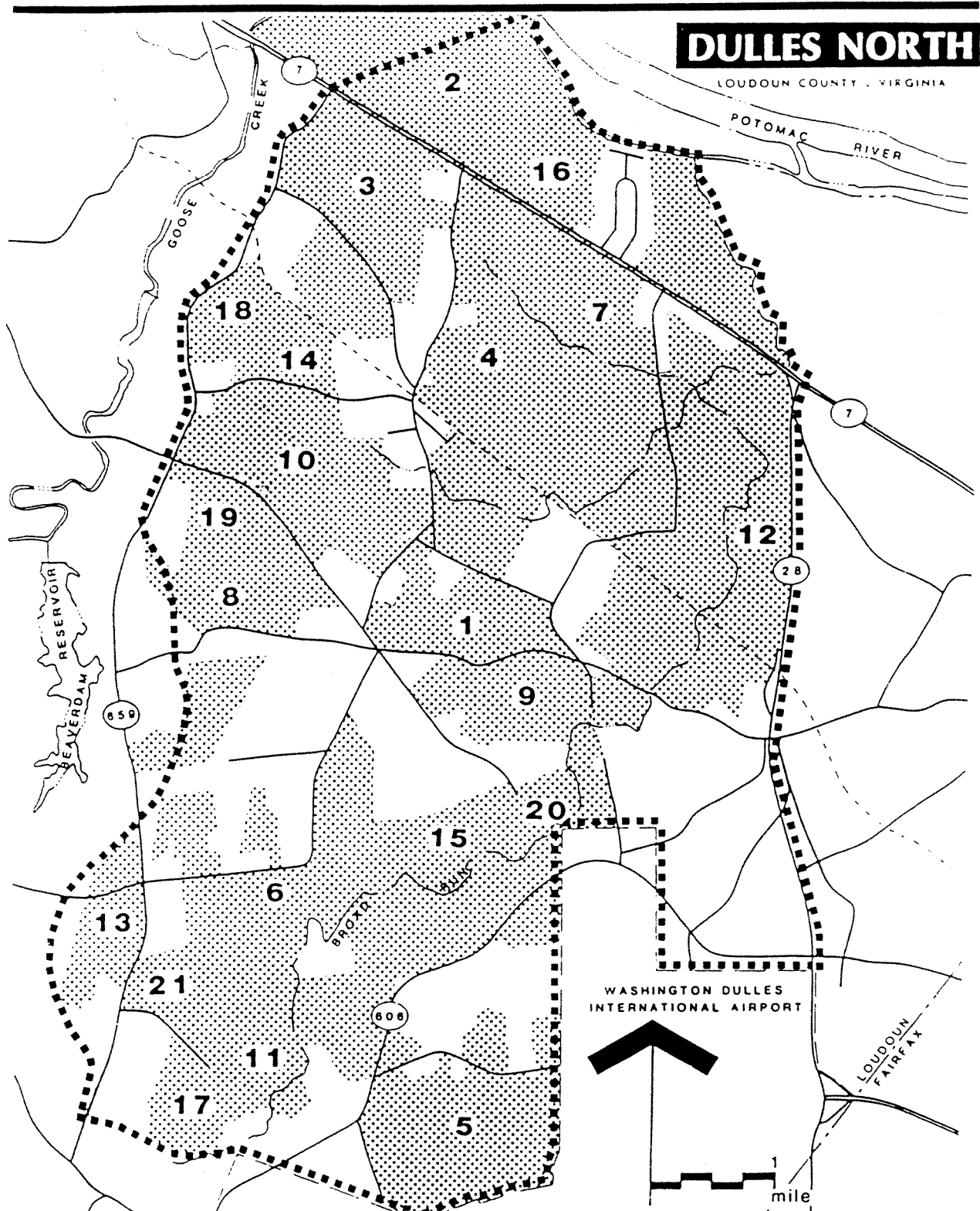
⁷ U.S. Bureau of the Census 1980 Summary Tape File 1 Tabulation 34

TABLE 3			
MAJOR PROPERTY HOLDINGS IN THE DULLES NORTH AREA			
Holding Number	Tax Map/ Parcel	Acreage	Owner Status: Local/Absentee
10	78-55A; 79-3; 79-3A	587	Absentee
11	92-18	454.2	Absentee
12	80-1-3	425.4	Absentee
13	92-4	415.3	Absentee
14	61-51; 61-52	389	Absentee
15	93-13	309	Local
16	62-1	281	Absentee
17	92-15; 92-16	274	Absentee
18	61-22	273.9	Absentee
19	78-49; 78-51, 78-54, 78-54C	238.9	Local
20	93-6	232.6	Absentee
21	92-24	226	Absentee
TOTAL		16,541.9 acres	

Table 3 shows that over 12,500 acres of land or 75% of the major properties are held by absentee owners and that the average parcel or contiguous tract size is over 650 acres. The fact that over 60% of the land in the planning area is owned by people or corporations who may wish to develop it is significant. The average size and general interlocking character of such a large number of holdings suggest that it would be in the best interests of the property owners as well as the County to consider future disposition and/or development in a comprehensive and coordinated manner.

D. EXISTING ZONING

The Zoning Ordinance is an important instrument of local government in implementing community land use decisions and policies. The existing zoning in the Dulles North area reflects a number of historical factors which may no longer be appropriate for this area (*See Figure 7, page 13*). An erroneous assumption that this area could be developed on individual septic fields and private wells is reflected in the nearly 11,000 acres of R-1 (*single-family, one acre lot minimum*) between Route 659 and Broad Run. Immediately in and around Ashburn is a significant 36.4 acre cluster of C-1 (*Commercial*)



MAJOR PROPERTY HOLDINGS

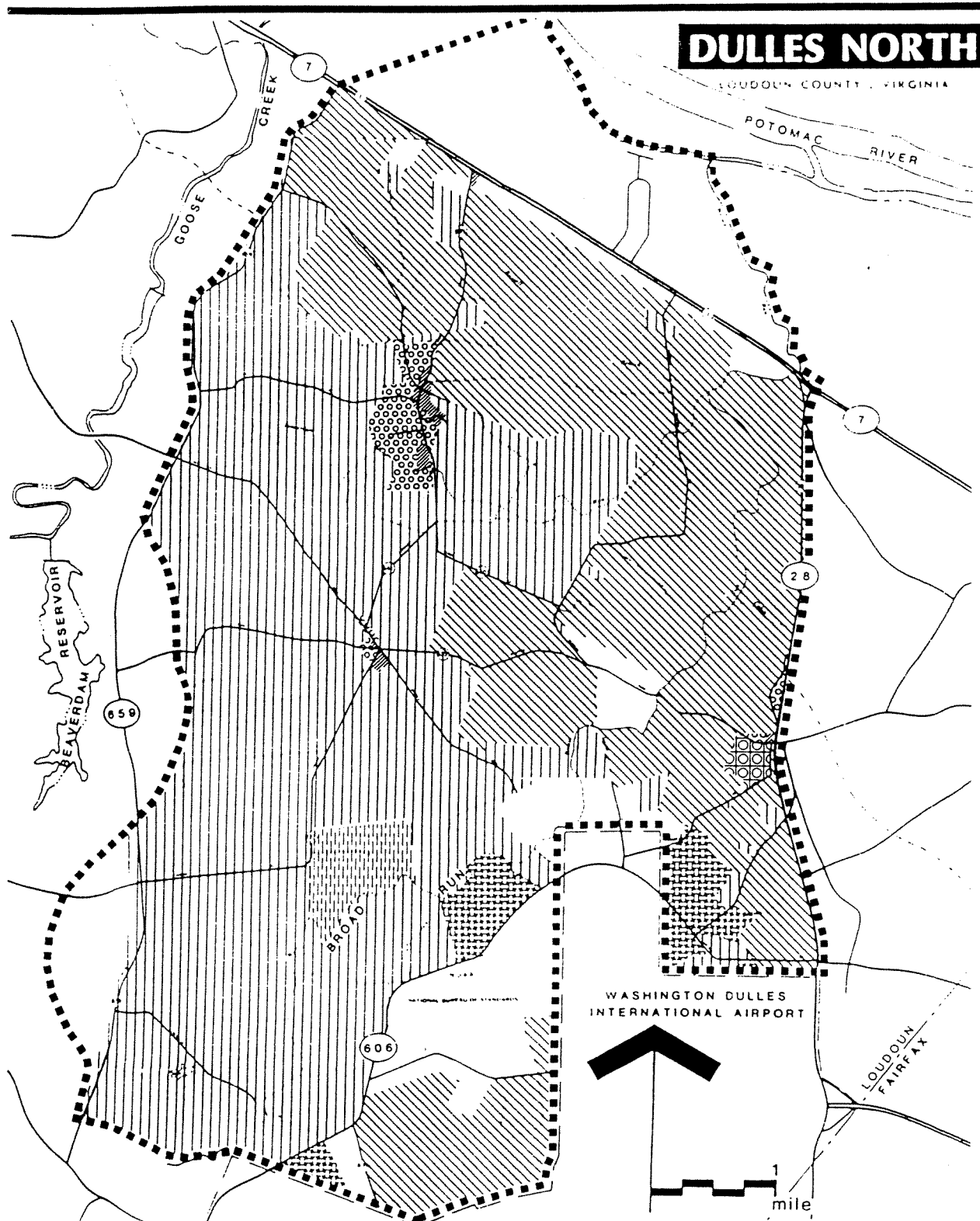
FIGURE 6

OCTOBER 21, 1985

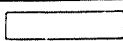



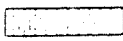





MAJOR PROPERTY
PLANNING AREA BOUNDARY

See Table 3, Page 11



EXISTING ZONING

	A-3		PD-GI
	C-1		PD-SC
	PDH-24		R-1
	PD-IP		R-2

..... PLANNING AREA BOUNDARY

FIGURE 7

OCTOBER 21, 1985

NOTE: FLOOD HAZARD ZONING DISTRICTS are not shown on this figure. See Figure 16, Page 37 for generalized floodplain information.

parcels which formed the Old Washington and Old Dominion Railroad depot, a mill and other commercial enterprises. The very extensive 6,753 acres of PD-IP along Route 7 and Route 28 reflects the expectations of the 1960's and early 1970's for Dulles Airport's impact on local employment expansion. There are only 3,318 acres of A-3 zoning in the easternmost section of the planning area. A total of 299 acres of land in the center of the planning area are zoned PDH-24 for 692 dwelling units. The land in question lies at the right angle bend of Route 772 and was rezoned as two tracts, Broad Run Meadows in 1976 and Ashburn Associates in 1977. Future land use proposals will probably require large scale rezonings, particularly of the residentially zoned land.

TABLE 4			
ACREAGE OF ZONING DISTRICTS IN DULLES NORTH AREA⁸			
	Zoning Districts	Acreage⁹	Percentage
R-1	Single-family, one-acre min. lot	10,797 ac.	50.0%
R-2	Single-family, 1/2 acre min. lot	172 ac.	0.8
PDH-24	Planned Development Residential	299 ac.	1.4
A-3	Rural Residential/Agricultural Uses	3,639 ac.	16.8
C-1	Commercial	54 ac.	.3
PD-IP	Planned Development Industrial Park (Light)	6,523 ac.	30.2
PD-GI	Planned Development Industrial Park (Heavy)	116 ac.	0.5
TOTAL		21,600 Ac.	100%

The general location of these zoning districts in the area are shown on Figure 7, page 13.

Table 5 highlights recent zoning actions in the Dulles North area which include a number of employment districts being added to the south side of Route 7 and two residential districts added to the center of the Planning area which were noted above. The locations of these zoning actions are shown on Figure 8, page 16.

⁸ This table does not include the approximately 3,800 acres of the Floodplain district.

⁹ Figures computed by Loudoun County Department of Planning, Zoning and Community Development from zoning maps.

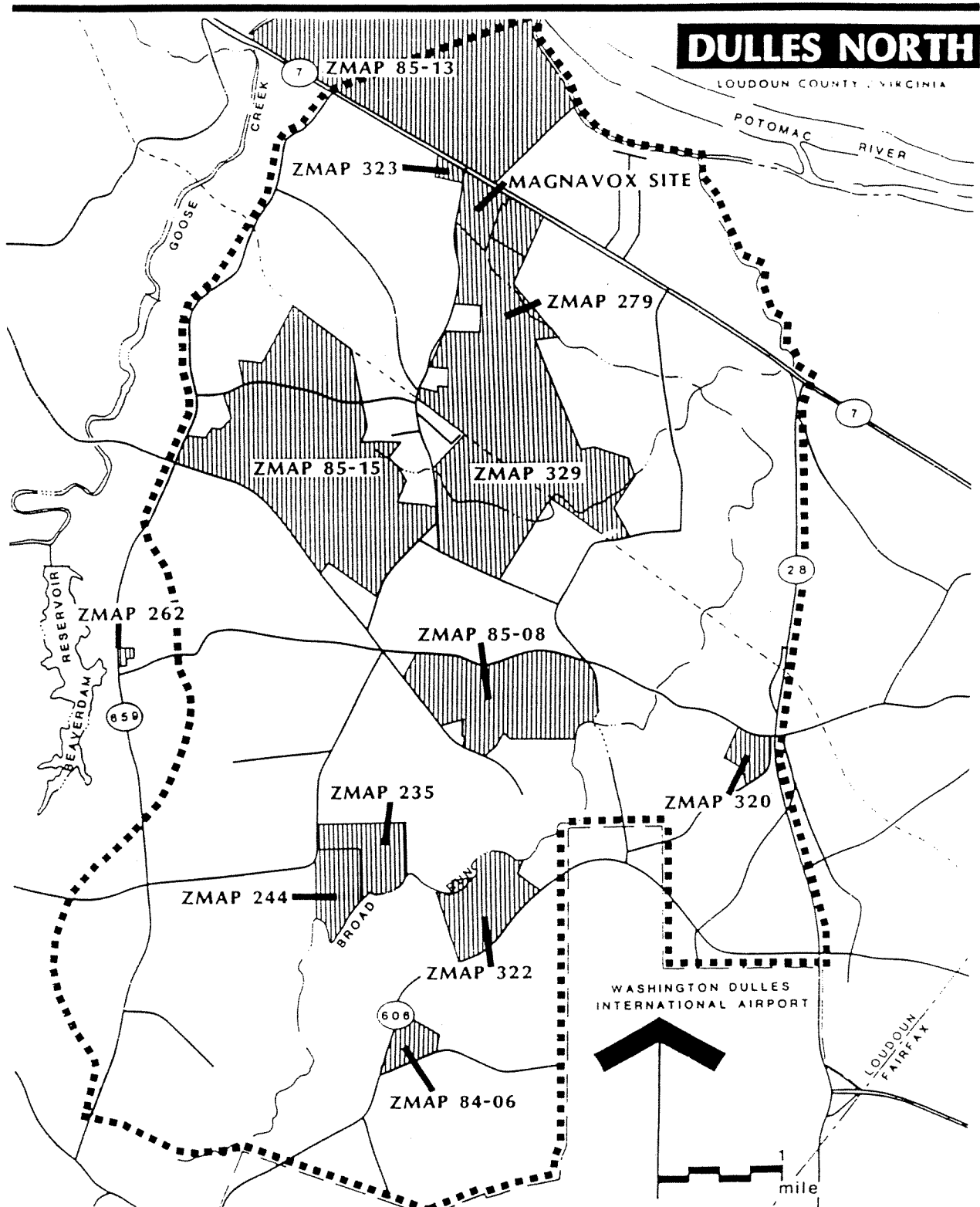
TABLE 5			
RECENT ZONING ACTIONS IN THE DULLES NORTH AREA			
Name and File #	Size	Requested Zoning	Final Action
Ashburn Assoc., ZMAP #235	196 acres	PDH-24	Approved - 1976
Broad Run Meadows, ZMAP #244	103 acres	PDH-24	Approved - 1977
Glenn Norton, ZMAP #262	4.1 acres	C-1	Approved - 1978
Birchfield, ZMAP #279	40 acres	PD-IP	Approved - 1979
Daniel Ross, ZMAP #295	4.9 acres	PD-IP	Denied - 1981
Ashburn Junction, ZMAP #323	4.9 acres	PD-IP	Approved - 1983
Philip Norton, ZMAP #322	222 acres	PD-GI	Approved - 1984
Ashburn Village, ZMAP #329	1,580 acres	PDH-24	Pending
Leary, ZMAP #84-06	60 acres	PD-GI	Denied
Sterling West, ZMAP #85-08	347 acres	PDH-12	Pending
Ashburn Farms, ZMAP #85-15	1,274 acres	PDH-12	Pending
Potomac Park, ZMAP #85-13	2,267 acres	PDH-12/ PD-OP	Pending

E. HISTORIC RESOURCES

Figure 9, page 17 shows the location of historic sites in the planning area which have been researched by the Virginia Department of Historic Landmarks. Table 6, page 18 identifies the sites and gives a short summary of the history of these buildings, structures or sites.

It is clear that the house at Belmont Plantation now in the possession of IBM represents the most significant historical structure in the area. The former Washington and Old Dominion Railroad right-of-way and associated engineering structures across the Broad Run and other smaller streams represent the most extensive man-made engineering project within the planning area. Figure 8, page 16 suggests just how important the W&OD was in the development of Ashburn in the late 19th and early 20th century.

The majority of the structures and/or sites surveyed by the Department of Historic Landmarks are late 19th century, the period when the area was enjoying agricultural prosperity. None, except Belmont, demonstrate any substantial architectural sophistication but they are of considerable value as vernacular

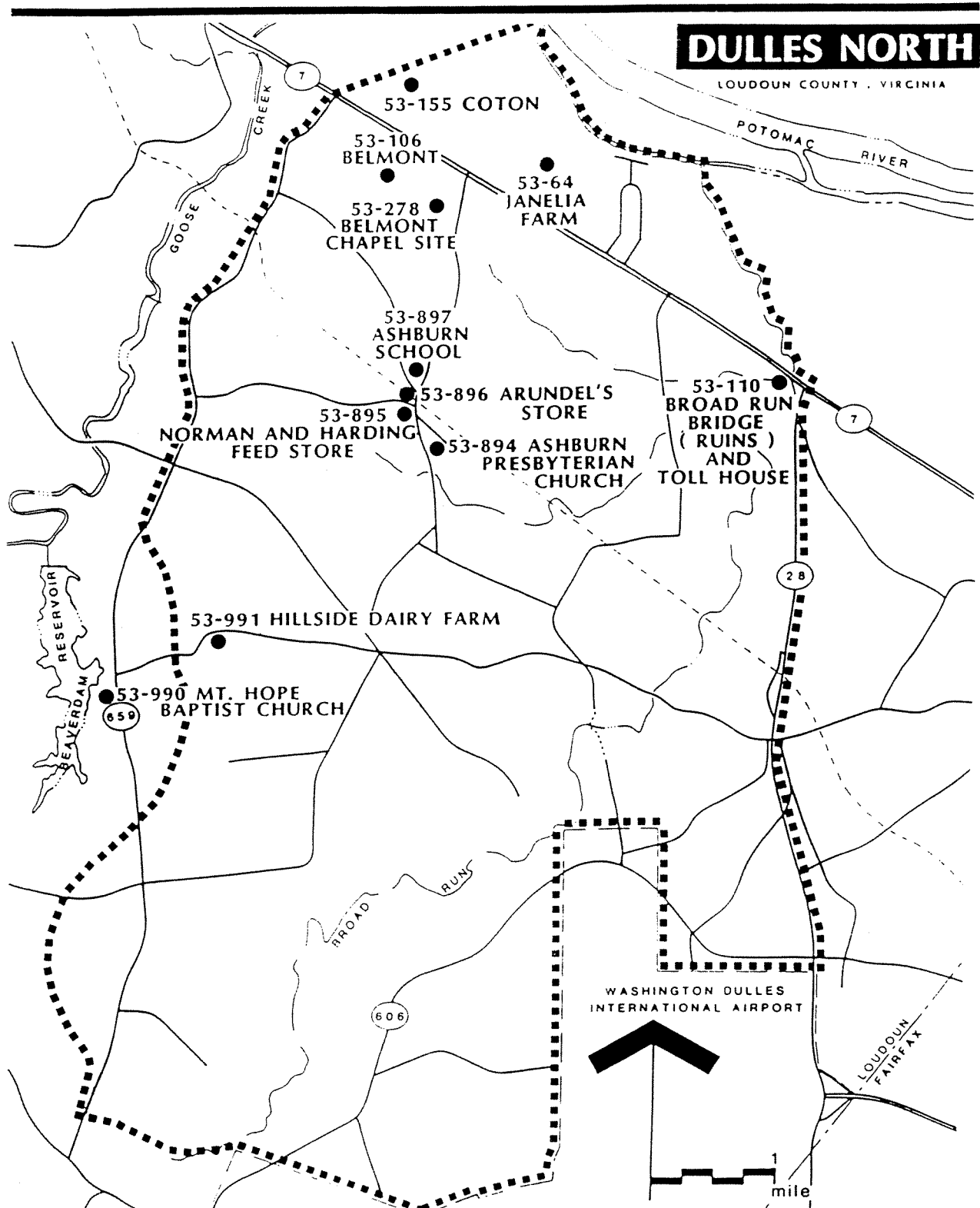


RECENT ZONING ACTIONS

FIGURE 8

OCTOBER 21, 1985

-  SITE
-  PLANNING AREA BOUNDARY



HISTORIC RESOURCES

FIGURE 9

OCTOBER 21, 1985

- HISTORIC SITE SURVEYED BY VIRGINIA HISTORIC LANDMARKS COMMISSION
- PLANNING AREA BOUNDARY

representations of a way of life. Some, such as the Ashburn Presbyterian Church are very good and well maintained examples of their types.

The village of Ashburn is a fine example of a late 19th century town, built where three roads and the new railroad converged. It was an excellent site for a market town and it prospered. The appearance of the village has changed little in the past 40 years. There are a number of good vernacular Victorian buildings and the residents appear to be interested in maintaining the pleasant character of the place. It is valuable as a somewhat rare example of a whole village built in the late 19th century in a County best known for its 18th and early 19th century structures, villages and towns.

TABLE 6	
SITES AND STRUCTURES SURVEYED BY VIRGINIA DIVISION OF HISTORIC LANDMARKS	
VHLC #	
53-84	Janelia Farm - (<i>Part of the Lee family's Coton Farm</i>). House built in 1936 now on National Register; 66 acre easement along river front donated to Northern Virginia Regional Park Authority.
53-106	Belmont - Built by Ludwell Lee 1799-1803. State and National Registers.
53-110	Broad Run Bridge (<i>ruins</i>) and Toll House - Built by Leesburg Turnpike Co. 1820. State and National Registers. (<i>See <u>Eastern Loudoun Area Management Plan.</u></i>)
53-155	Coton - Home of Ludwell Lee's cousin, Thomas Ludwell Lee. Some original buildings survive. Now property of Xerox Corporation.
53-276	Washington and Old Dominion Railroad (W&OD) - Originally Alexandria, Loudoun and Hampshire Railroad begun in 1855 and built as far west as Leesburg by 1860.
53-278	Site of Belmont Chapel - Built 1840, destroyed by fire 1967.
53-894	Ashburn Presbyterian Church - Built 1876, fine example of board and batten Carpenter gothic.
53-895	Norman and Harding Feed Store - Built about 1880; typical commercial building; now used by Weller tile.
63-896	Arundel's Store - Ruins of combined house and store in Ashburn; 1870's. Now destroyed.
53-897	Ashburn School - One room school house, built 1892; poor condition; used as warehouse.

TABLE 6	
SITES AND STRUCTURES SURVEYED BY VIRGINIA DIVISION OF HISTORIC LANDMARKS	
VHLC #	
53-990	Mt. Hope Baptist Church - 1893. One of the largest frame churches in the County; very good Carpenter Gothic; recently very carefully restored.
53-991	Hillside Dairy Farm - mid 19th century; stone farmhouse unusual in eastern Loudoun.

F. PUBLIC UTILITIES AND FACILITIES

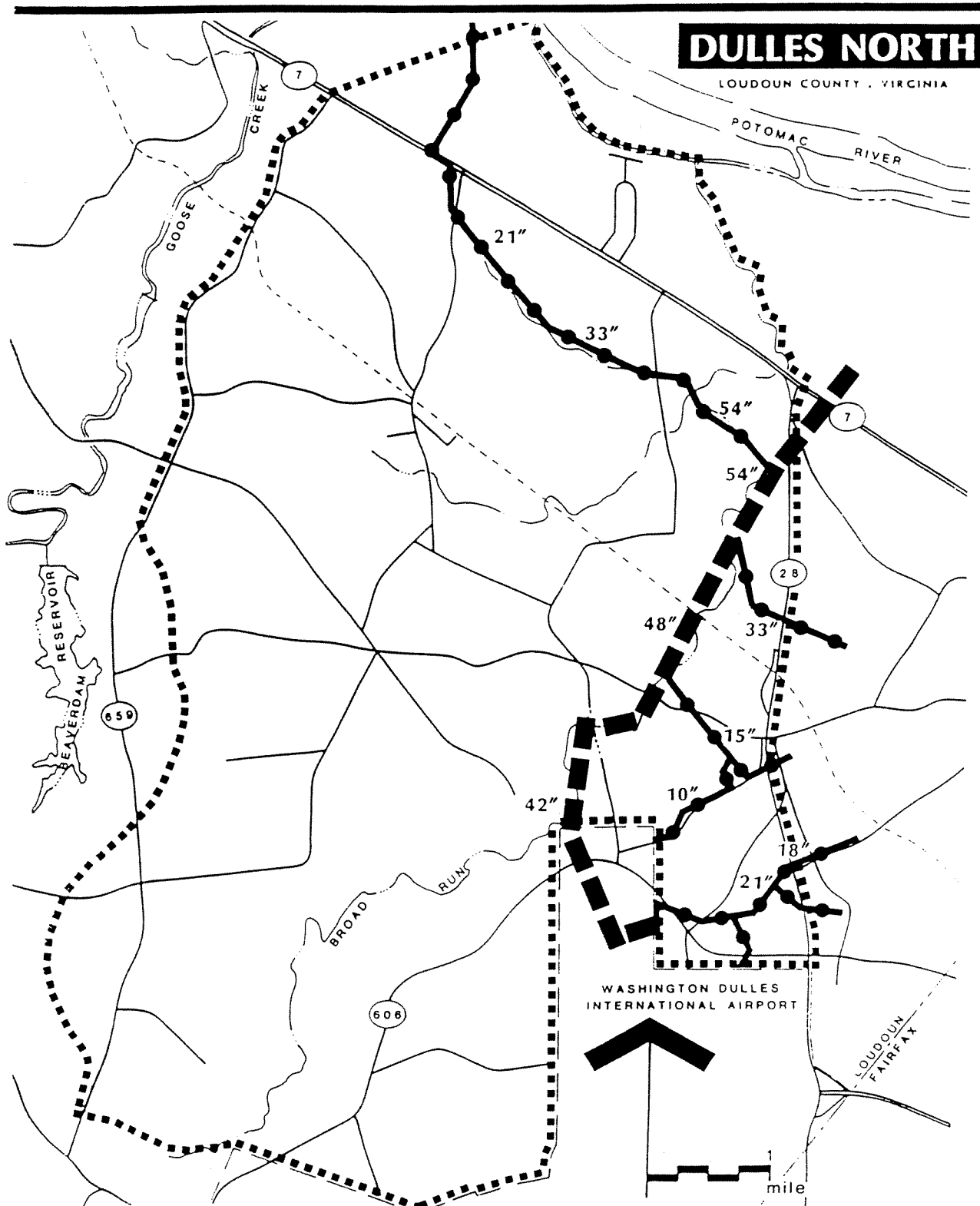
Introduction

Public facilities such as central sewer and water, roads, airports, schools, recreational centers and parks provide the physical structure for community life. Some of these facilities may be constructed by private developers but they usually represent a very sizable public investment on the part of a community whether the investment was made by the local jurisdiction using property tax revenue, by the State Highway Department using gasoline taxes or by the Federal Government. The planned extent of residential and commercial or industrial growth in the Dulles North area will have considerable implications for sewer and water provision. The question of how much sewer capacity may be available is critical to the planning decisions made in this area plan. The following inventory provides background on the public utilities and facilities which will have a major influence on future development in the area.

1. Sewer:

The soils in the planning area generally do not support septic systems and many area homes are experiencing septic field problems. The Dulles North planning area lies mainly within the Broad Run watershed and can all be sewered by a wastewater main which originates at Dulles Airport, follows the Broad Run to the Potomac and then joins the Potomac Interceptor Sewer. This major installation terminates at the District of Columbia's Blue Plains Sewage Plant.

At this time, the planning area is crossed by one sewer line, constructed by the Xerox Corporation which extends from the Broad Run trunk line up Russell Branch to Ashburn Junction where it crosses Route 7 into the Xerox Training Facility. Figure 10, page 20, shows the location of sewer lines in the planning area.



SEWER LINES

FIGURE 10

OCTOBER 21, 1985

- POTOMAC INTERCEPTOR**
- LCSA TRUNK SEWER**
- PLANNING AREA BOUNDARY**

Loudoun County at present discharges some 2.1 million gallons of sewage per day into the Potomac Interceptor Sewer from 7,000 residences in eastern Loudoun. A further 10,000 - 14,000 residences are planned in that planning area¹⁰ which is estimated to generate at buildout a total of up to 6.3 million gallons of sewage per day. Residential development in Dulles North equal in size to eastern Loudoun would generate a combined sewage flow of at least 13 million gallons per day for the two planning areas.

There is a question regarding Loudoun County's reserved sewage capacity at Blue Plains. Under an agreement of October 24, 1963 between the Loudoun County Sanitation Authority and the District of Columbia, the County has on reserve 17.93 million gallons per day of sewage treatment capacity. Between 1970 and 1974 a series of interrelated legal suits on the part of Federal, State and local authorities reduced the District of Columbia's expansion plans at Blue Plains while increasing the quality of effluent which Blue Plains could discharge into the Potomac. In a compromise agreement to which Loudoun was not a party, the County's reserved sewage capacity was reduced from the original 17.93 million gallons to 3.208 million gallons. In January of 1974 the Loudoun County Sanitation Authority filed a suit for Declaratory Judgement in the Superior Court of the District of Columbia seeking to confirm the validity of its 1963 agreement with the District of Columbia. The matter was temporarily resolved in July 1974 when Loudoun County and the District entered a stipulation that the 1963 agreement *"is valid, subsisting and enforceable according to its terms."*¹¹

Since that time, the Loudoun County Sanitation Authority has received assurances from the District of Columbia that it, *"acknowledges Loudoun County's and the Authority's reliance upon the District to provide for Loudoun's sewage treatment needs as set forth in the 1963 agreement and this (letter) will serve as your commitment that the District will exercise its best efforts to meet these needs."*¹² (Underlining by Loudoun County Department of Planning, Zoning and Community Development.)

Subsequent to this assurance, a consortium¹³ of the major jurisdictions and users of Blue Plains initiated a study to determine Blue

¹⁰ Loudoun County Department of Planning, Zoning and Community Development, Land Development Section, 1984.

¹¹ D.C. Superior Court, CA-121-74

¹² Letter from James O. Gibson, Assistant City Administrator for Planning and Development, to Stanley M. Franklin, Esq., Boothe, Prichard and Dudley, Attorneys for the Loudoun County Sanitation Authority, June 7, 1979.

¹³ The District of Columbia, Montgomery and Prince Georges Counties, Maryland and Fairfax County, Virginia.

Plains' sewage treatment capacity given current technologies, flows and the region's growth rate. This study included a feasibility review of possible off-site treatment plants such as the construction of an 11 million gallon per day facility on Broad Run in Loudoun County. The construction of a plant on Broad Run would comply with Virginia State Water Control Board (SWCB) policy for the watershed. In conformance with this policy SWCB will approve and assist in finding financial assistance for the construction of one large regional sewer plant in the Broad Run watershed. The consortium study concluded that an 11 million gallons per day sewage plant located on Broad run would cost between \$47.5 - \$62.7 million in 1983 dollars. The wide range of costs reflected uncertainty on the level of water purification which would be required.

2. Central Water:

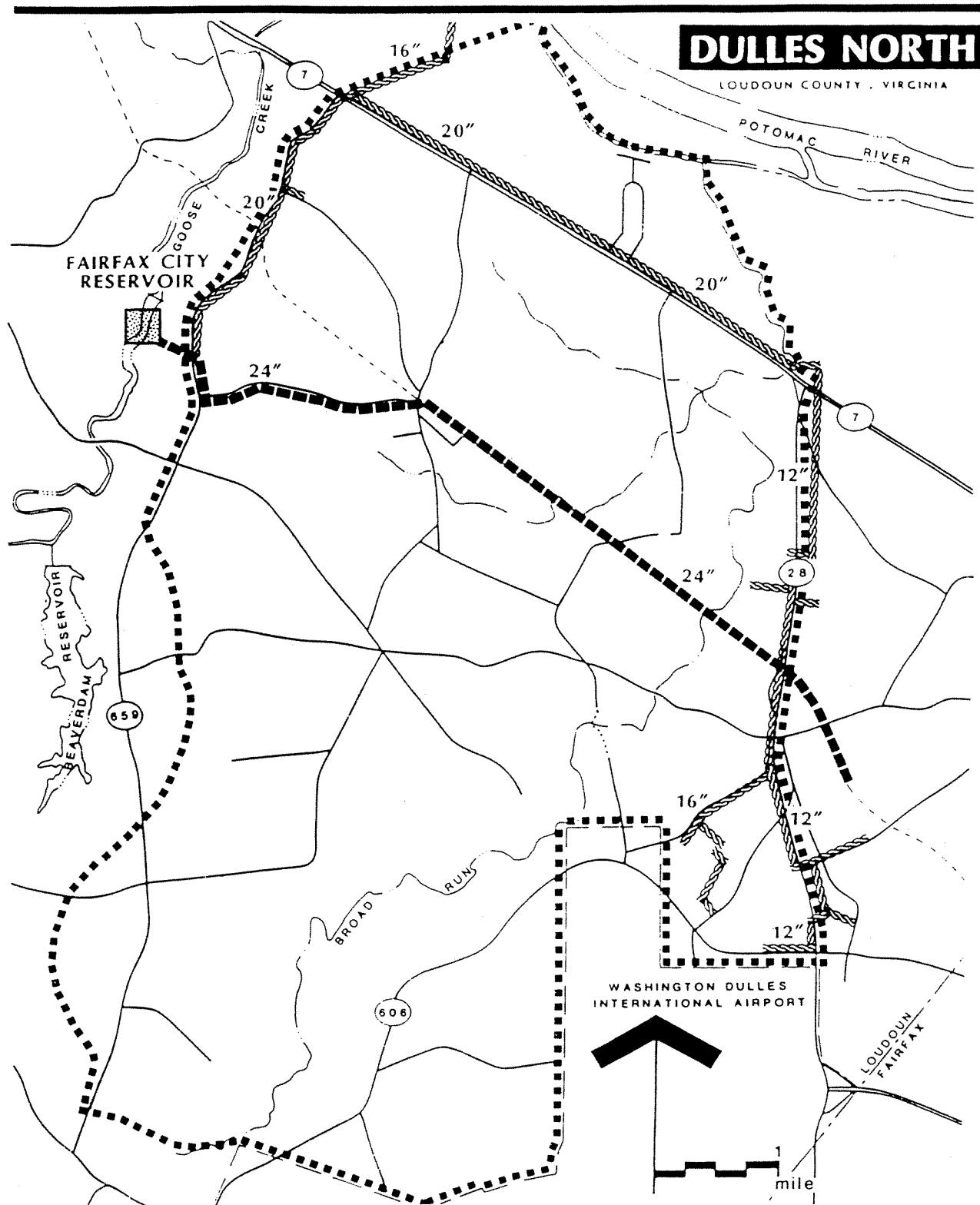
The City of Fairfax owns and operates a Water Reservoir and Treatment Plant on Goose Creek, just west of the planning area. The treated water is then conveyed in the 24' water main which the City of Fairfax constructed along Route 642 west of Ashburn and the Washington and Old Dominion railroad right-of-way (See *Figure 11, page 23*). The Loudoun County Sanitation Authority has installed a 20" water line across the Dulles North Planning Area. This main was laid in a northerly direction along Route 659 to Route 7 and then follows Route 7 to Broad Run and eastern Loudoun. The City of Fairfax Water Plant currently has an average delivery capacity of 15 million gallons per day with a potential of some 30 million gallons per day. Loudoun has first tapping rights on the water of Goose Creek and presently the Sanitation Authority purchases 2.3 million gallons of water a day from the City of Fairfax.

Development buildout of eastern Loudoun will require a tripling of these water purchases while development of the Dulles North area will further increase the County's need for Goose Creek water. This increase may be accomplished by expansion of the Goose Creek waterworks. This might require the County's cooperation with the City of Fairfax in building additional capacity. On the other hand, the City of Fairfax presently sells water to Herndon and western Fairfax. These areas now have the option of purchasing water from the Fairfax County Water Authority's new Potomac Intake Facility located at Lowes Island. If the City of Fairfax ceased supplying Herndon and western Fairfax, sufficient capacity of the present Goose Creek Plant would be released to serve new development in and around Ashburn.

3. Transportation:

a. Roads

The Dulles North area is served by a set of roads which were designed to accommodate a very low density farm community (See



WATER MAINS

FIGURE 11

OCTOBER 21, 1985

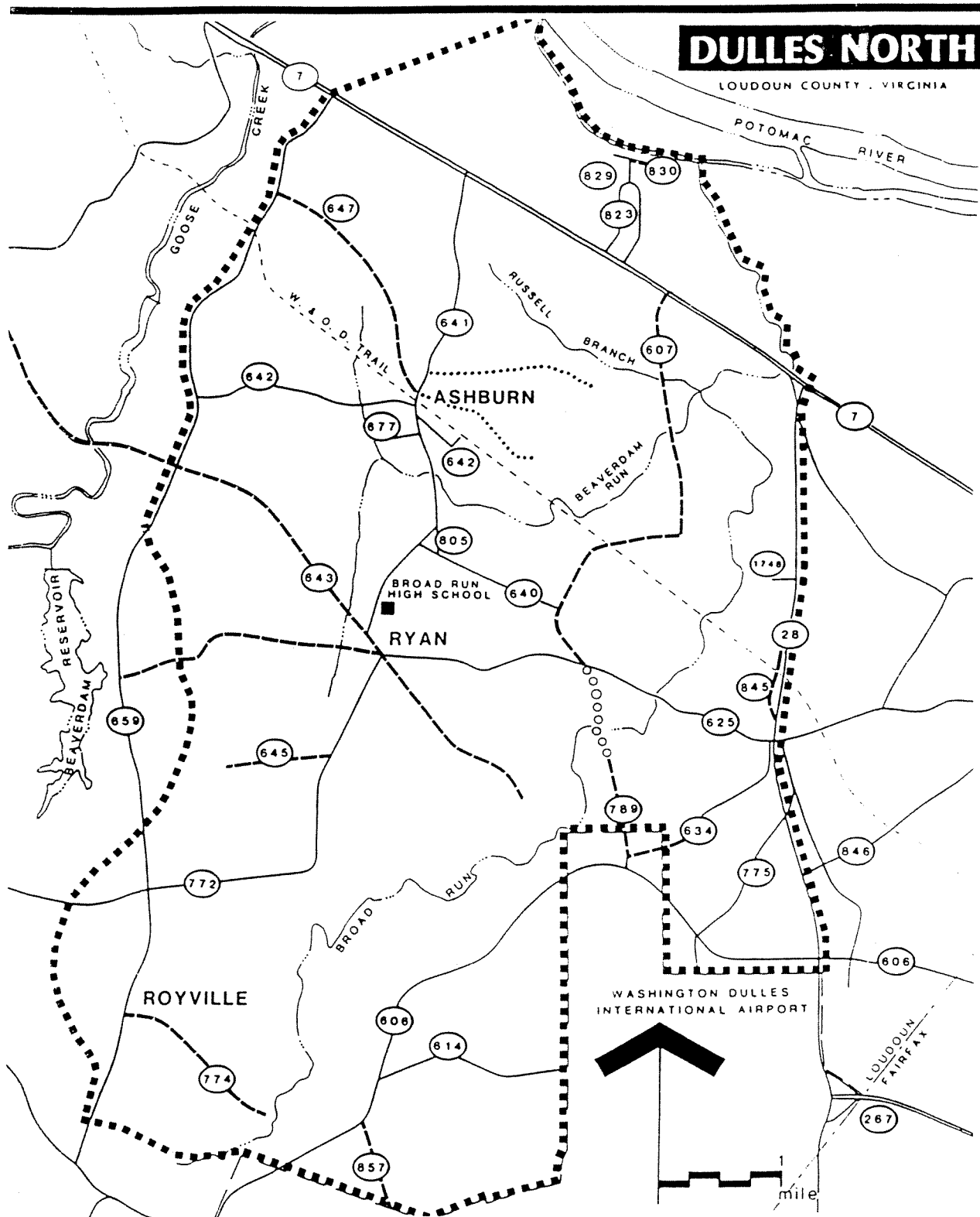
- LOUDOUN COUNTY SANITATION AUTHORITY MAINS
- FAIRFAX CITY MAINS
- PLANNING AREA BOUNDARY

Figure 12, page 25). Thus considerable road improvements will be necessary to accommodate future high density growth. Further description of the existing road system is provided by Table 7, page 26. Route 659 is hard surfaced and largely defines the western edge of the planning area while Route 641 is also hard surfaced and, when extended south by Route 772, forms a central north/south spine. Route 607 further east is not paved. Since Route 607 crosses Russell Branch, Beaverdam Run and Broad Run with their extensive floodplains, improving this road will be expensive. Route 625, which constitutes the Dulles North area east-west roadway north of Broad Run is paved only in part. Route 643 which follows a diagonal path across the Planning Area and could be developed as a logical commuter artery to Route 28 and the Dulles Toll Road, is not paved and would require extensive and costly construction, especially at the Broad Run floodplain.

Arterial road linkage to Tysons Corner and Washington, D.C. is now mainly provided by Route 7 while Rt. 625 to Route 28 and the Dulles Access Road provides a minor linkage to the metropolitan core. Some commuters may follow Route 659 to Route 50 and go from there to the Fair Oaks area or even to Route I-66. The extension of the Toll Road to the Route 15 Bypass would provide an alternative east/west connector arterial route to Route 7 through the County. This road would not only provide a regional link, but an intercounty one between the east, Dulles Airport, and the Town of Leesburg. Construction of this limited access road which follows the alignment shown on the land use map creates a new link to the employment and recreational cores of the region.

Major development in the Ashburn area will require substantial new road investments. The County and the Virginia Department of Highways and Transportation unfortunately do not have the resources to implement such investments. However, for the preparation of the area plan, the Metropolitan Washington Council of Governments (COG) has conducted a preliminary traffic study based on one possible land use pattern shown on Figure 13, page 27.

A TRIMS (*Transportation Integrated Modeling Systems*) transportation model for the year 2010 was run on the Metropolitan Washington Council of Governments' computer. The model allocated vehicle trips from 11,000 dwellings and associated employment uses and thus assumed that the Dulles North area would be about 50% towards an ultimate buildout of 23,000 dwellings. The model also assumed that bridges would have been built over Broad Run at Routes 643 and 607 thus permitting traffic to flow directly to the Dulles Toll Road.

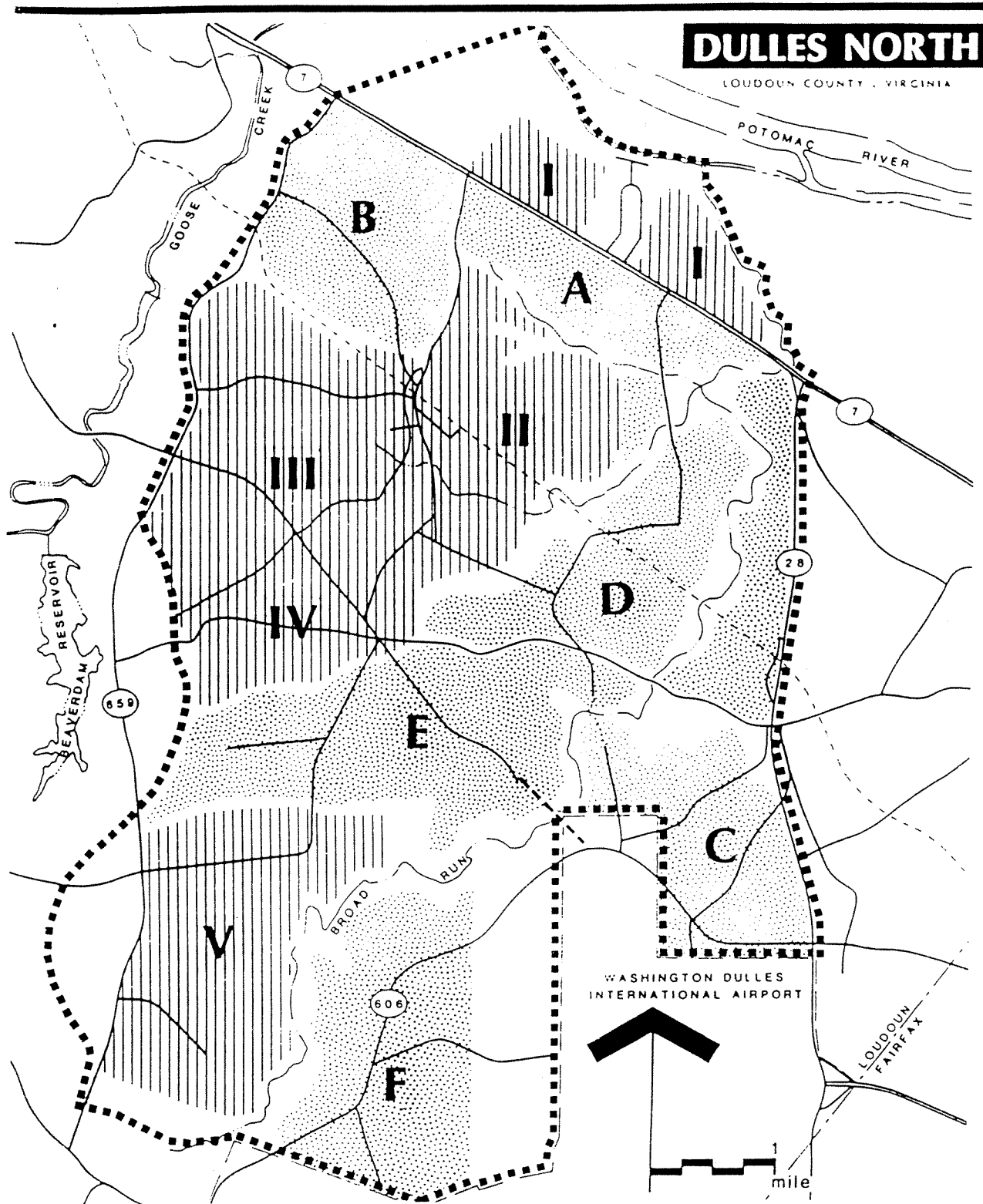


EXISTING ROADS **FIGURE 12**
OCTOBER 21, 1985

TABLE 7					
PRIMARY AND SECONDARY ROADS IN THE DULLES NORTH AREA					
Route	Length	R-O-W	No. of Lanes	Pavement	Average Daily Trips¹⁴
7	4.5	200' - 215'	4	Hard Surface	14,310
606	4.07	80' - 90'	2	Hard Surface	2,305
607	3.20	30'	2	All Weather	72
	0.50	30'	2	Hard Surface	480
614	1.60	30'	2	Hard Surface	120
625	2.30	30'	2	All Weather	180
	3.27	50'	2	Hard Surface	1,285
640	1.24	30'	2	Hard Surface	151
641	4.10	30' - 40'	2	Hard Surface	906
642	1.80	30'	2	Hard Surface	119
643	1.70	30' - 40'	2	Light Surface	72
	2.2	30' - 40'	2	All Weather	822
645	1.00	30'	2	Light Surface	70
647	2.00	30'	2	All Weather	35
659	9.62	30' - 50'	2	Hard Surface	400-1,600
772	3.17	30'	2	Hard Surface	490
774	1.1	30'	2	Light Surface	13
789	.8	30'	2	Light Surface	43
805	.24	30'	2	Hard Surface	305
842	.59	30'	2	All Weather	96
856	.82	30'	2	All Weather	13

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Average Daily Vehicle Trips derived from the 1982 vehicle counts on Route 7 and 1982 vehicle counts on all other roads made by the Virginia Department of Highways and Transportation and reported in "Average Daily Traffic Volumes on Interstate, Arterial and Primary Routes 1982" and "Secondary Traffic Tabulation Counts May - September 1982."



TRANSPORTATION STUDY MODEL

FIGURE 13

OCTOBER 21, 1985




-  EMPLOYMENT
-  RESIDENTIAL
-  PLANNING AREA BOUNDARY

Figure 14, page 29 shows the number of vehicle trips identified by the model on the Dulles North roads and contrasts these with the vehicle trips actually counted in 1982.

The Metropolitan Washington Council of Governments has also supplied the County with Table 8 which identifies the number of traffic lanes that would be needed to support suburban development in the Dulles-North area.

TABLE 8				
REQUIRED MAJOR ARTERIAL LANES IN THE DULLES NORTH AREA (At an Average Level of Service "D"¹⁵)				
	1980	1990	2000	2010
Daily East-West Traffic Trips	57,100	73,400	122,400	163,200
East-West Lanes	7	9	15	20
Daily North-South Traffic Trips	22,800	57,100	106,100	146,900
North-South Lanes	2.8	7	13	18

The Required Major Arterial Lane Table suggests that the Dulles North area has 1/3 of the lanes needed to accommodate traffic in moving east-west and only 1/6 of the lanes needed for north-south traffic in 2010. Some of these traffic lanes may be appropriately provided in part by local collector roads as the subdivisions are developed.

However, such roads can carry only about 50% of the traffic of a major arterial. The importance of increasing the number of traffic lanes on Route 7, Route 606 and Route 28 is evident while Figure 14, page 29, highlights the need for improvements to Route 643 as a controlled access arterial road from Route 641 to the Dulles Toll Road. These major road investments will require a partnership between the public and private sectors to ensure the timely provision of adequate facilities. One last consideration is that of car/van pools and public transit which could reduce pressure on major commuter routes such as Route 28, the eastern sections of Route 643 and Route 606.

¹⁵

A "D" level of service designates traffic operating with little freedom of maneuver, at varying operating speeds and approaching unstable flow.

LOUDOUN COUNTY, VIRGINIA



AVERAGE DAILY TRIPS
IN THOUSANDS

OCTOBER 21, 1985

- 29 -

b. Dulles International Airport

Part of the Dulles North area lies immediately to the north of the Washington Dulles International Airport. In 1984 a total of 180,000 aircraft operations took place at the airport. 50% of these operations were general aviation, 26% were domestic and foreign airlines, 17% were airtaxi and corporate services and 7% were military flights. While half the aircraft operations were general aviation, more than half of the airport's revenue was generated by the 3.5 million passenger airline traffic. Such revenue will be needed to support new airport investment in land and facilities as Dulles continues to grow to a projected 394,000 operations and 7.5 million passengers in the year 2000. Proposed construction of an additional north-south runway and an additional east-west cross-wind runway in the next century would permit airport expansion to 740,000 aircraft operations per year.

The location of Dulles International Airport has generated employment investments not only in Loudoun but also in western Fairfax and Prince William Counties. High value, relatively light goods can be economically shipped from the airport to arrive within hours at destinations in the rest of the continent and the world. The planning area's proximity to the airport places it in an excellent position to capture a substantial percentage of this possibly "*High Tech*" employment growth.

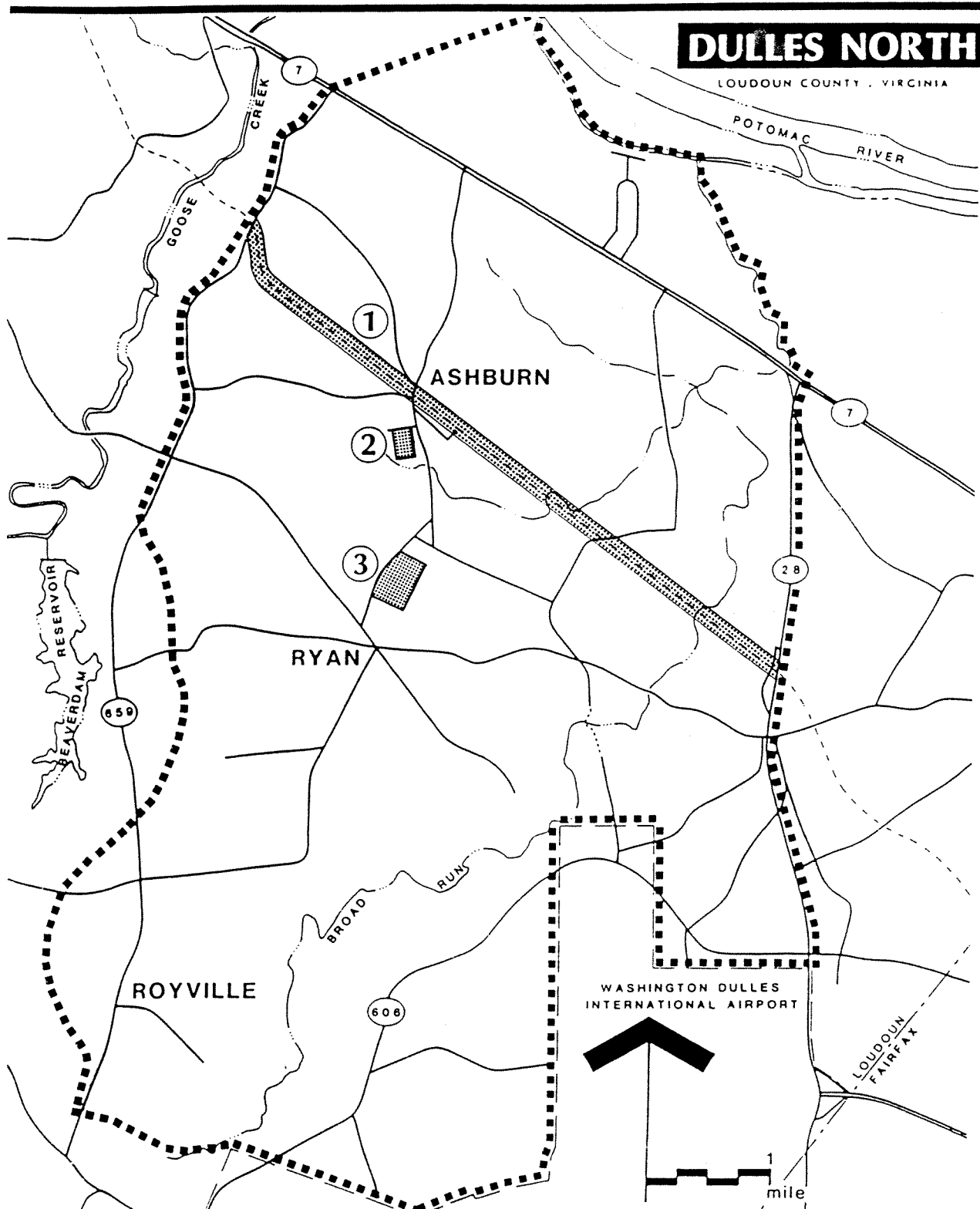
4. Recreation:

a. Washington and Old Dominion Railroad Regional and Potomac Heritage Scenic Trail Parks

The Northern Virginia Park Authority, of which Loudoun County is a member, has been developing the former Washington and Old Dominion Railroad right-of-way as a 45 mile linear park for hikers, bicyclists and horseback riders. The Park Authority, which purchased most of the linear facility from the Virginia Electric and Power Company¹⁶, has also purchased a number of small adjacent tracts of land along the right-of-way and one of these is just west of the planning area near Route 659. The Park Authority has also accepted easements from certain property owners along the Potomac for the future development of the Potomac Heritage Scenic Trail park along the shoreline but much more land is still required to realize this project. Figure 15, page 31, shows the location of recreational facilities in the Dulles North area.

16

The Virginia Electric and Power Company retained an easement to accommodate its power transmission lines.



SCHOOLS AND PARKS

FIGURE 15

OCTOBER 21, 1985

- ① NORTHERN VIRGINIA REGIONAL PARK AUTHORITY
WASHINGTON AND OLD DOMINION RAILROAD TRAIL
- ② ASHBURN ELEMENTARY SCHOOL
- ③ BROAD RUN HIGH SCHOOL AND ANNEX

..... PLANNING AREA BOUNDARY

b. County Parks and Recreation Department

The Loudoun County Department of Parks and Recreation has made a number of investments in the Dulles North planning area. As part of its ongoing policy of working with the School Board, the Department has developed a basketball court, a softball field and a fitness trail on the Ashburn Elementary School property. On the Broad Run High School property the Department has built a tennis court and a softball field.

Since both properties belong to the Loudoun County School Board, use of these recreational facilities depends on the discretion of the School Board rather than the Parks and Recreation Department. There is no community center for indoor recreational use in the Ashburn area but residents may use the Leesburg, Arcola or Sterling community centers.

The Ashburn planning area contains a number of properties and land areas such as floodplains and wooded land which are suitable for development as undisturbed nature areas, passive recreation or active recreation areas.

5. Public Safety:

There is a volunteer fire company in Ashburn with an active membership of 30 volunteers. The fire station is located within the village and possesses a rolling stock inventory of two fire attack pumpers, one reserve pumper and one brush fire unit.

The Loudoun County Sheriff's Dept. provides police protection for the Dulles North area from its facilities in the Town of Leesburg.

6. Schools:

There is an elementary school located in Ashburn with a use capacity of 177 students and a 1985 enrollment of 72 or 41% of capacity. Broad Run High School is located on Route 641 between Ashburn and Ryan. The High School has a use capacity of 1,193 students and a 1985 enrollment of 1,022 students or 86% of capacity.

G. NATURAL RESOURCES AND ENVIRONMENTAL FACTORS

Introduction

The natural features of the Dulles North area have greatly influenced the historic settlement pattern and will continue to place constraints on the future development of the area. A major factor is the soil which, while still in agricultural

use, is not as productive as soils west of the Catoctin Ridge. Many of the farms are now either large scale rental operations or abandoned and held for speculation unlike the traditional family farms previously found in the area and still characteristic in the Loudoun Valley. The relatively poor soil also has contributed to the dispersed population and sparse settlement of the area; it is very difficult to locate a suitable site for a septic system and existing communities such as Ashburn are characterized by numerous septic system failures.

The area is generally flat with small sections of steep slopes located along watercourses. The creeks are the dominant feature of the area and include Broad Run and its major tributaries, Russell Branch and Beaverdam Run. Each of these is characterized by a 100 year floodplain¹⁷ which is unsuitable for intensive development but could be used as a buffer between new communities or industrial and residential developments. Future large-scale growth in the area will significantly alter the present ecological balance which is an especially critical concern with the streams of the area. Intensive development, residential and non-residential, will change the visual character of the environment as well and the existing large expanses of open land will be drastically changed. The plan should take both the ecological balance and the visual environment under consideration.

1. Hydrology/Water Resources:

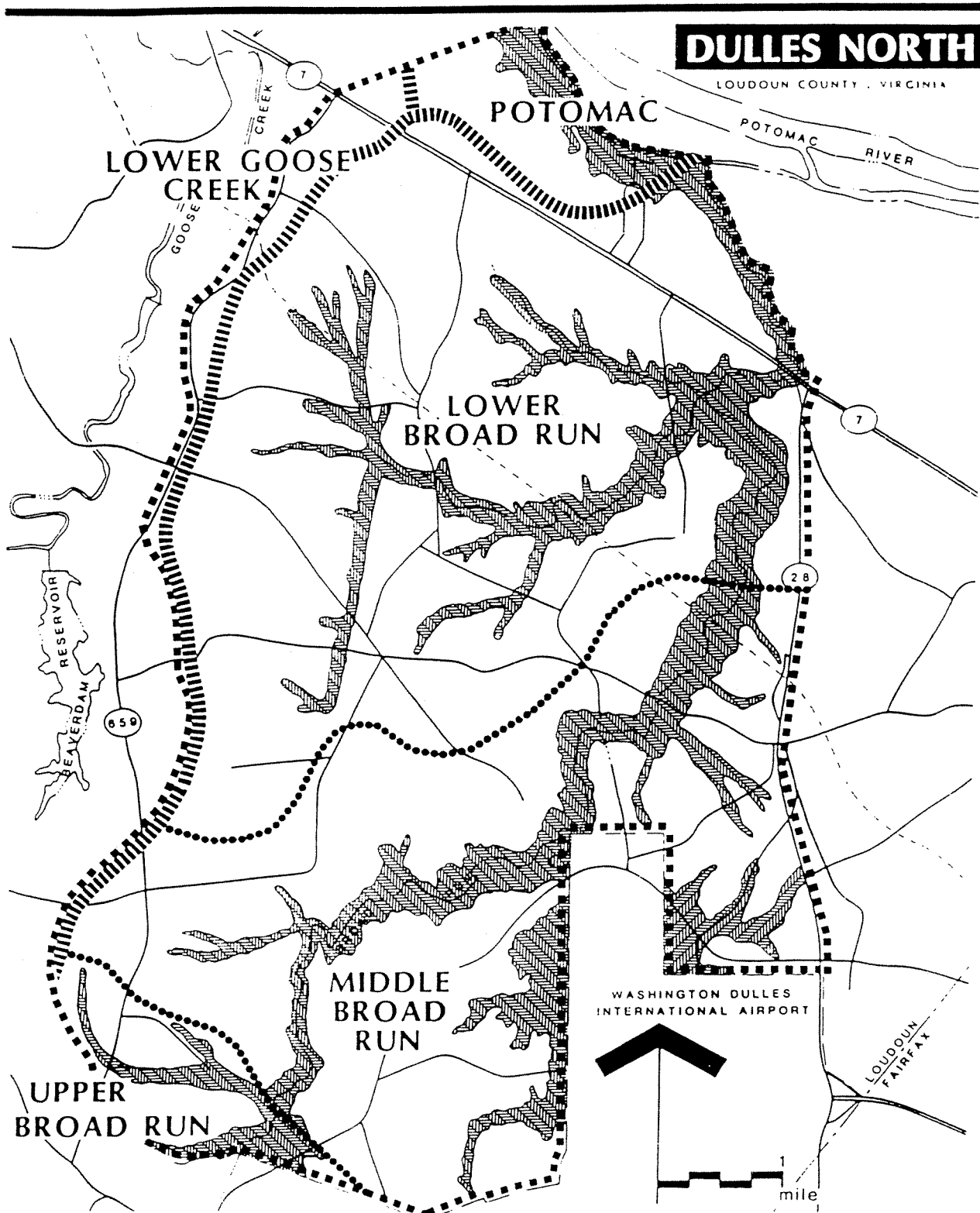
Water plays a very prominent role in the shaping of land and the water systems of streams and rivers are significant factors in the design of communities. Consequently, it is very important to understand and respect the overall hydrologic system of the Dulles North area before deciding where and when to locate particular land uses.

The planning area is located almost completely in the 82 square mile Broad Run watershed which is entirely within Loudoun County. Broad Run drains directly into the Potomac River and is separated into sub-watersheds, the largest of which are Russell Branch and Beaverdam Run (*See Figure 16, page 34*).

There are approximately 3,800 acres of 100 year floodplain in the planning area (*See Figure 16, page 34*) that have been mapped either by the Federal Insurance Administration of the U.S. Department of Housing and Urban Development or the Virginia Soil and Water Conservation Service. Existing County policy designates floodplains as hazardous areas and land uses within 100 year flood zones are currently regulated by a County zoning ordinance adopted in January 1981.

¹⁷

100 year floodplain is not an area which floods every 100 years but where there is a 1% chance of a flood every year.



WATERSHEDS **FIGURE 16**
OCTOBER 21, 1985

- ||||| MAJOR WATERSHED
- SUBWATERSHED
- ▨ 100-YEAR FLOODPLAIN
- PLANNING AREA BOUNDARY

The Broad Run watershed was ranked as a Priority I Critical Watershed based on nine different non-point source pollution factors for 1977¹⁸. This means that Broad Run is considered an important watercourse in terms of water quality of the Potomac River and development in this watershed should proceed with care.

Another aspect of the area's water resources is the need for stormwater management to control flooding, reduce erosion and improve water quality. Studies indicate that Broad Run presently has a severe erosion and water quality problem from agricultural activities which could worsen if future land development is not designed and built properly. The County Soil and Water Conservation District estimates that nearly 40% of the land is losing more than the average County loss of four tons of soil per acre per year largely to the area streams.¹⁹ This is of special concern due to the new Fairfax County water supply intake located on the Potomac River approximately six miles downstream from the mouth of Broad Run.

In addition, future development within the Dulles Planning Area will change much of the existing land surface and will increase both the rate and volume of stormwater runoff, causing erosion, sedimentation and stream flooding, unless stormwater management practices are systematically implemented in the area.

2. Geology/Mineral Resources:

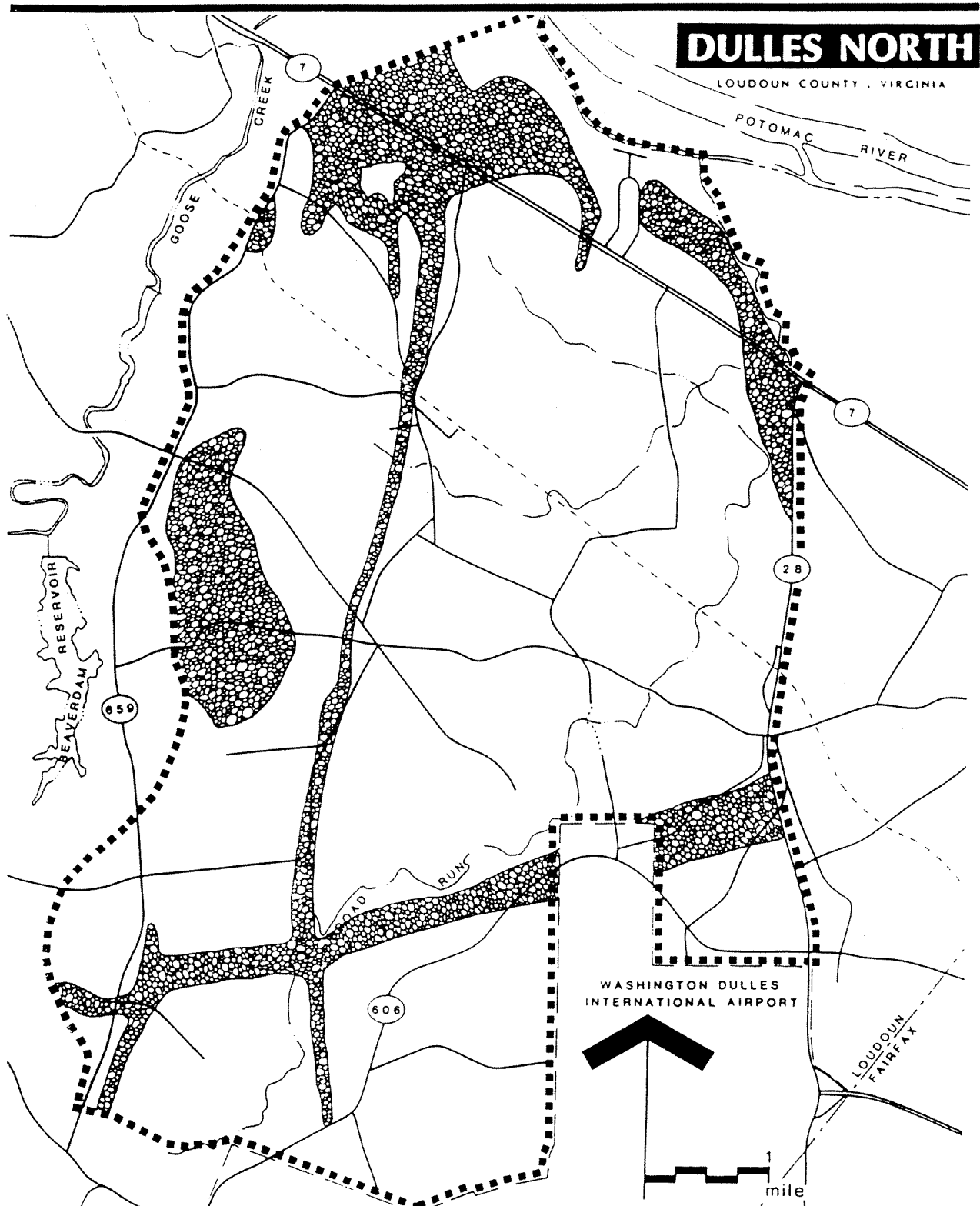
The Dulles Planning Area is located in the Triassic lowlands of the Piedmont physiographic province. The geologic formations have been mapped by USGS and further refined by the Loudoun County Soil Scientist. The majority are either shale or sandstone. The most significant geologic resource in the area is diabase (*See Figure 17, page 36*) which is quarried for crushed stone at five quarry sites in the County that are not within but are near the Dulles North planning area.

3. Soil Resources:

The soils of the area are generally suitable for crops, such as corn but they are not as productive as those in the Loudoun Valley to the west. There are large sections with poorly drained, clay soil ("*jack soil*") that are classified by the County Soil Scientist as generally having poor to very poor potential for septic systems and would also present engineering problems

¹⁸ *"Analysis of Nonpoint Source Pollutant Loads in the Washington Area and the Selection of Critical Watershed"*; Department of Water Resources; Metropolitan Washington Council of Governments; February 1980.

¹⁹ *Natural Resource Inventory*, Loudoun Soil and Water Conservation District. December, 1981. *"Water Quality Modeling Study: Goose Creek, Broad Run and Sugarland Run Watersheds"*; Regional Resources Division; Northern Virginia Planning District Commission; June, 1980.



GEOLOGIC RESOURCES **FIGURE 17**
OCTOBER 21, 1985

-  DIABASE FORMATION
-  PLANNING AREA BOUNDARY

if developed on central sewer and water (See *Figure 18, page 38*). This poor soil is a major contributor to the historically sparse settlement of the area and is a significant constraint on growth in the area; both Ashburn and Arcola have numerous septic system failures.

In addition, the shrink/swell expansive properties of the clay soil make new construction difficult and expensive. Basements are generally not suitable in this type of soil since the dimensional changes of the soil heave foundations, crack the walls and lead to subsequent flooding. In such circumstances an on-grade concrete "raft" foundation is an alternative, while the best solution may be to completely excavate the jack soil and fill with a more stable soil.

4. Topography/Steep Slopes:

The area is made up of broad, undulating ridges and level land with elevations that generally range from 250 to 300 feet above sea level, with higher areas of 450 feet along Route 659.

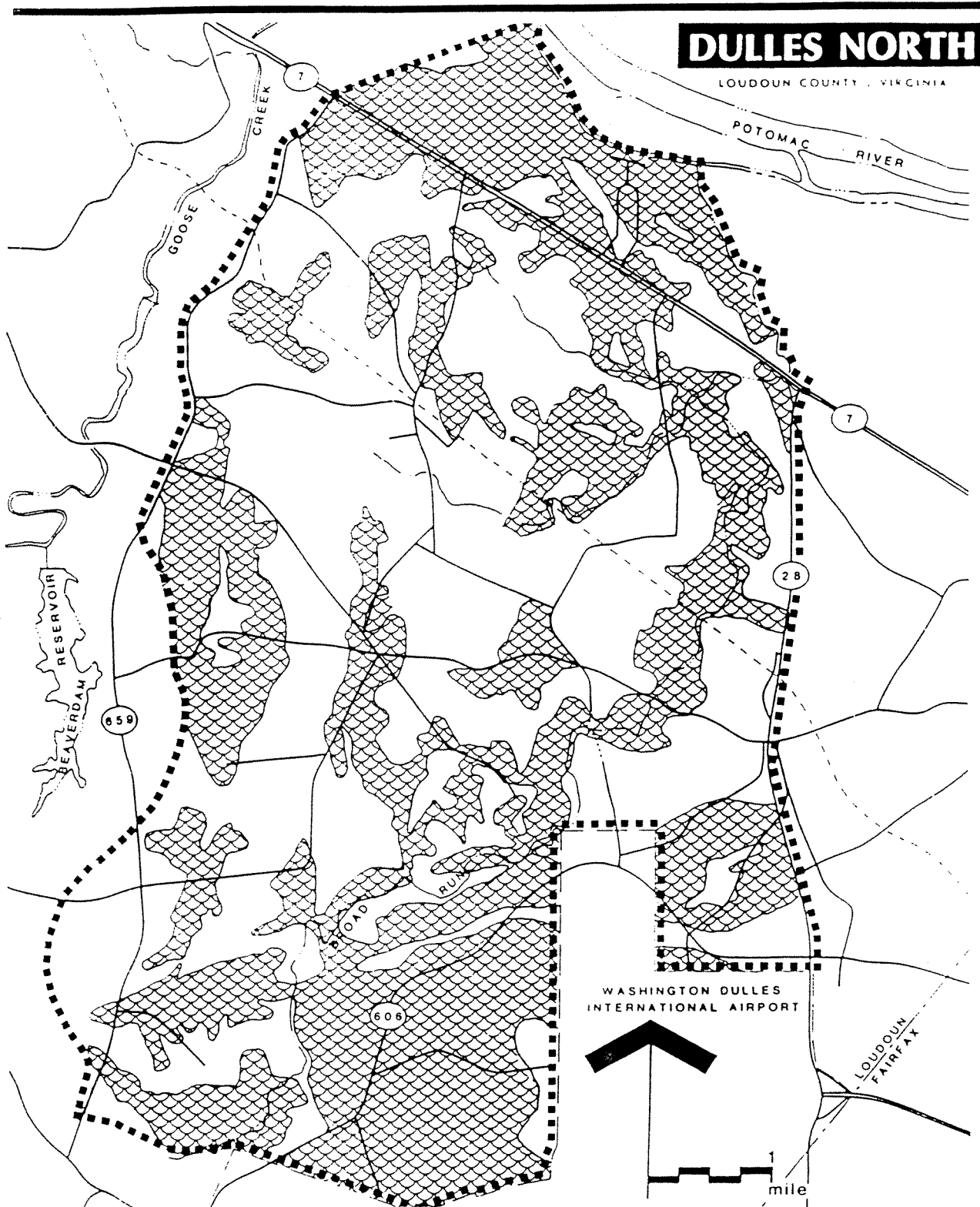
Small areas of steep slopes greater than 25% and from 15% to 25% are located along the watercourses, such as Broad Run, Beaverdam Run and the Potomac. Existing County policy discourages new development on slopes over 15% except when appropriate engineering practices are used.

5. Forest and Wildlife Resources:

Large and small tracts of woodlands exist throughout the Planning Area along watercourses, on steeper slopes or on abandoned agricultural land. Species composition of a woodland results from (1) the intrinsic distribution of particular species, (2) physical site factors such as soil, (3) past land use history. The predominant species of area upland hardwoods are white and red oak, hickory, maple and tulip poplar alternating with stands of Virginia pine on the poorer soils or red cedar on recently abandoned farm fields. In the floodplain and low, wet areas, the major species are sycamore, willow, sweet gum and green ash.

There is no existing inventory of the natural diversity of wildlife habitats or ecosystems within the Dulles North planning area or the County as a whole. There are, however, several general concepts which should be considered in the management of vegetation and wildlife when planning for new development:

- a. Provision for wildlife habitat is compatible with quality urban development. Proper management of wildlife and a diverse vegetation has been shown to enhance community values.



SOIL DEVELOPMENT SUITABILITY

FIGURE 18

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SOIL WITH VERY POOR POTENTIAL (CLASS IV - PLASTIC, WET, ROCKY, STEEP SLOPES)



PLANNING AREA BOUNDARY

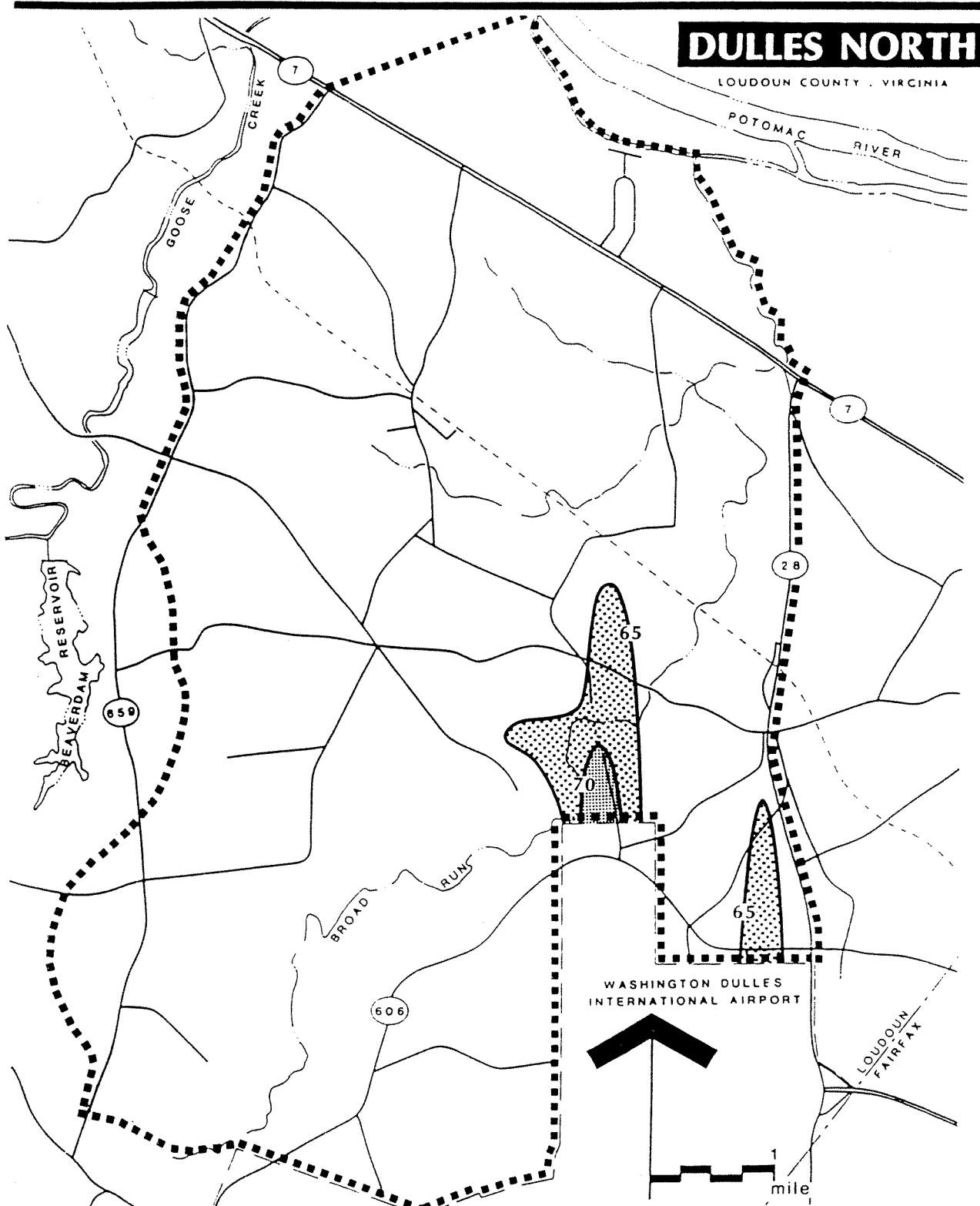
- b. Vegetation, particularly woodlands, maintains the quality of water resources, as it reduces flooding and erosion and can improve water quality.
- c. Linear corridors, such as stream valleys, floodplains, utility and road rights-of-way and fence rows function as key wildlife feeding, resting and breeding areas. These corridors can be incorporated into the design of new developments as utility and storm drainage easements, neighborhood trails, passive open space recreation areas and 100 year floodplain easements.

6. Aircraft Noise:

In 1984 a total of 180,000 aircraft operations took place at Washington Dulles International Airport. Preliminary 1985 data indicate that aircraft operations will be 14% above the 178,000 operations projected only two years ago. In that same period, four airlines have designated the airport as a regional "hub" and more airlines are expected to follow suit. It appears quite possible that the airport will reach its year 2000 projected 394,000 operation level well ahead of schedule. Such increases in operations are likely to generate a significant rise in ambient noise levels in the aircraft flight paths and in 1982 the FAA commissioned Peat, Marwick, Mitchell and Co. as consultants to prepare a noise impact study as part of the airport Master Plan update.

In order to determine the level of noise generated by airport traffic, the consultants used past aircraft arrival and departure routes and data from sound monitors stationed around Dulles which had been installed some years earlier to measure the noise of the Concorde. Aircraft do not follow specific routes in the manner of automobiles on roadways. Furthermore, the sound impact of an overhead aircraft varies depending on (a) what a person or household is doing: watching T.V., sleeping, entertaining in the backyard, and (b) the time of year: winter with closed windows, summer with open windows.


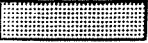

There is an ongoing study to codify aircraft noise impact. In 1982 the FAA released the third version of an integrated Noise Model (*Mod. 3.8*) based on (a) the acoustical energy content at 500 Hertz (*a note close to Middle C on a piano*), (b) the noise event rise time and duration, and (c) the noise peak level. Two measures are available to display the results of the noise exposure calculations, grid cells and contours. Noise exposure can be calculated for the center of a grid of 40 acre cells surrounding the airport given certain aircraft types, arrival and departure routes, etc. Noise contour lines can then be traced through these grid cells for predetermined noise exposure levels. Figure 19 and Figure 20, pages 40 and 41 show the 1982 and future full potential Ldn (*average day/night noise levels measured in decibels*) noise contour profiles for the Ashburn area. Weather conditions, angle of ascent or descent other than the eight degrees

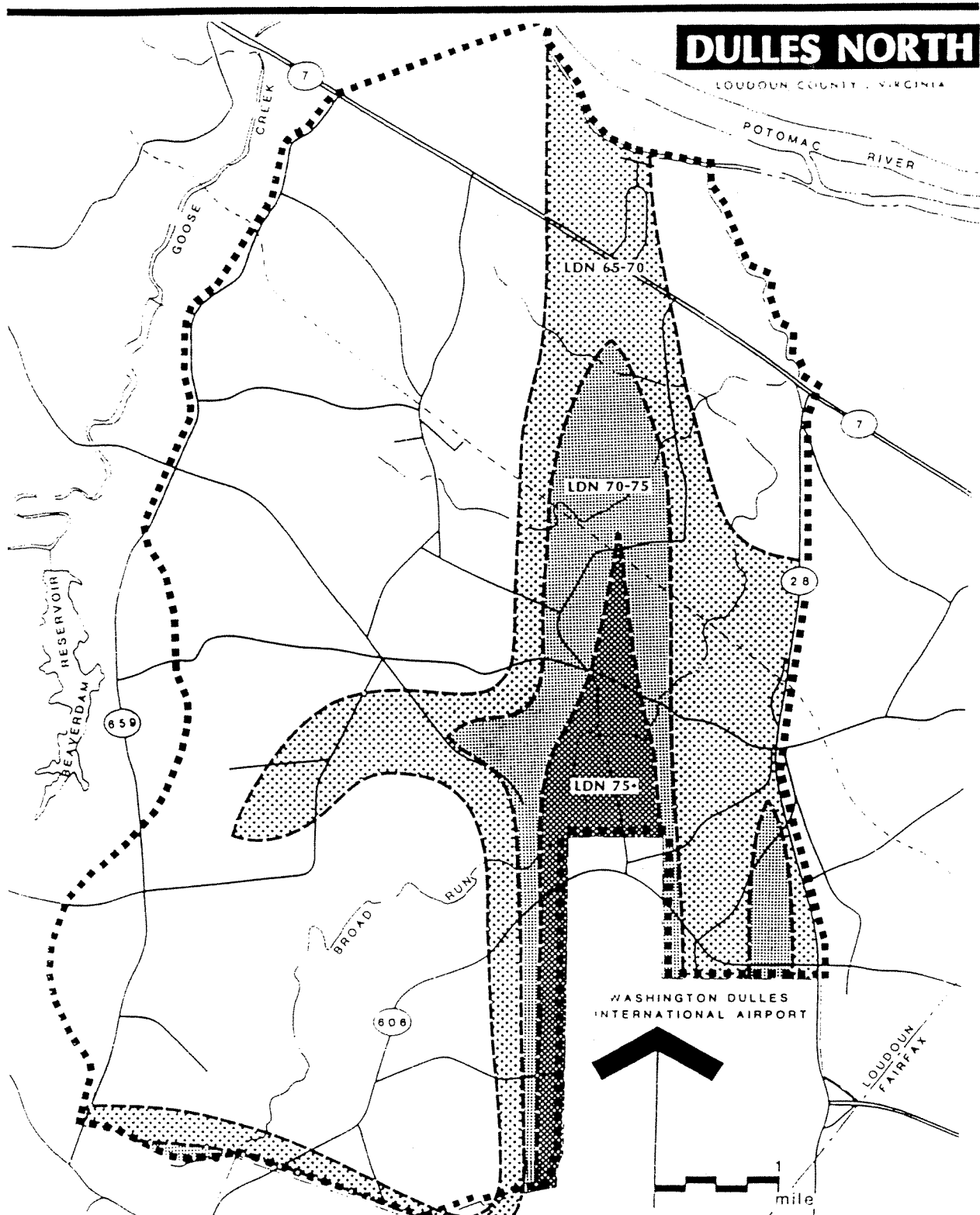


AIRPORT NOISE CONTOURS 1982

FIGURE 19

OCTOBER 21, 1985

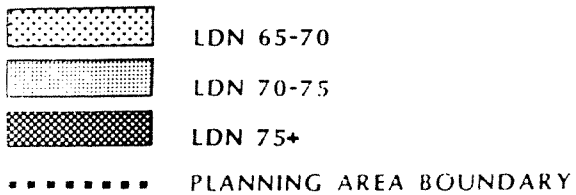
-  LDN 65-70
-  LDN 70-75
-  PLANNING AREA BOUNDARY



ULTIMATE AIRPORT NOISE CONTOURS

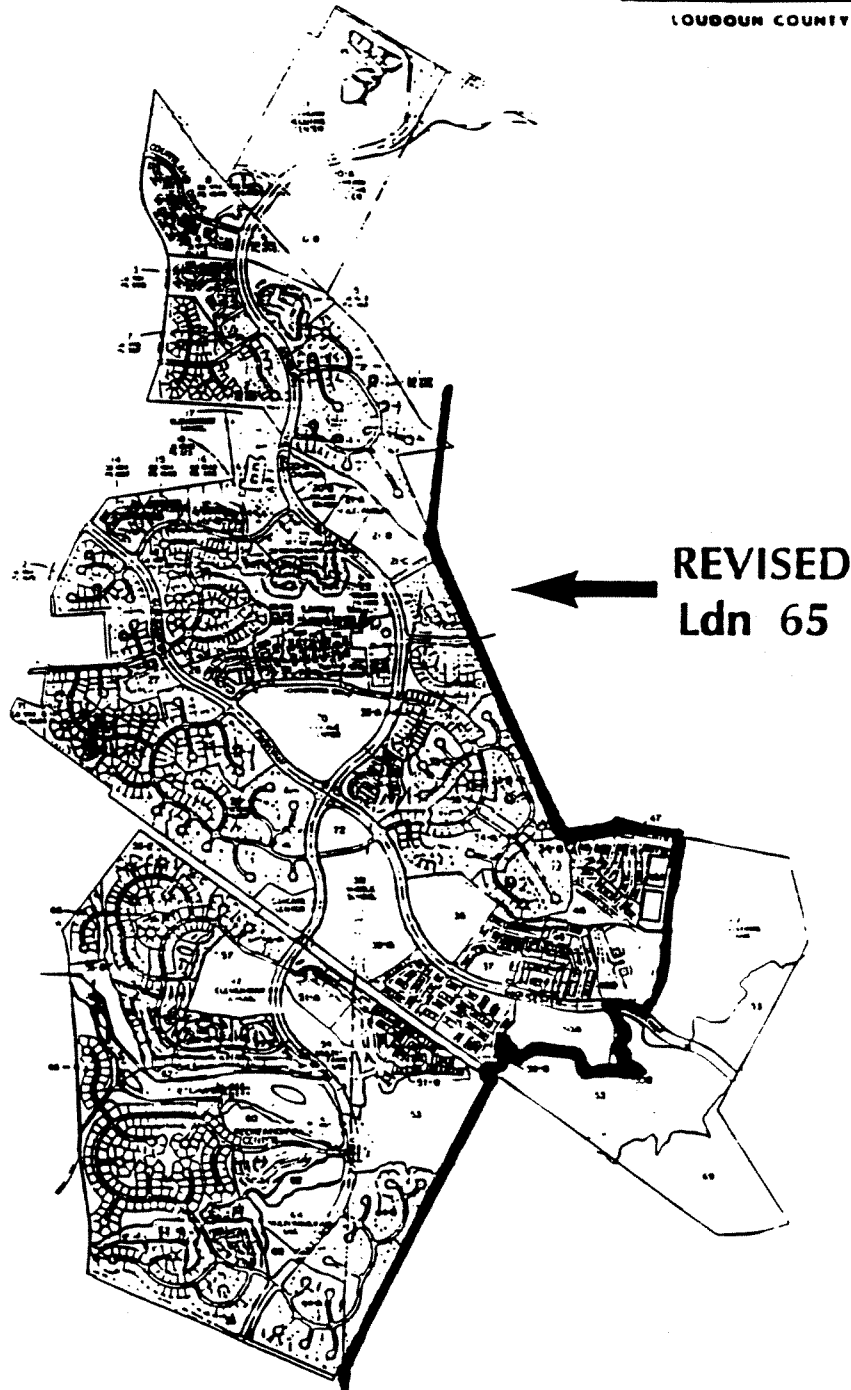
FIGURE 20

OCTOBER 21, 1985



DULLES NORTH

LOUDBON COUNTY, VIRGINIA



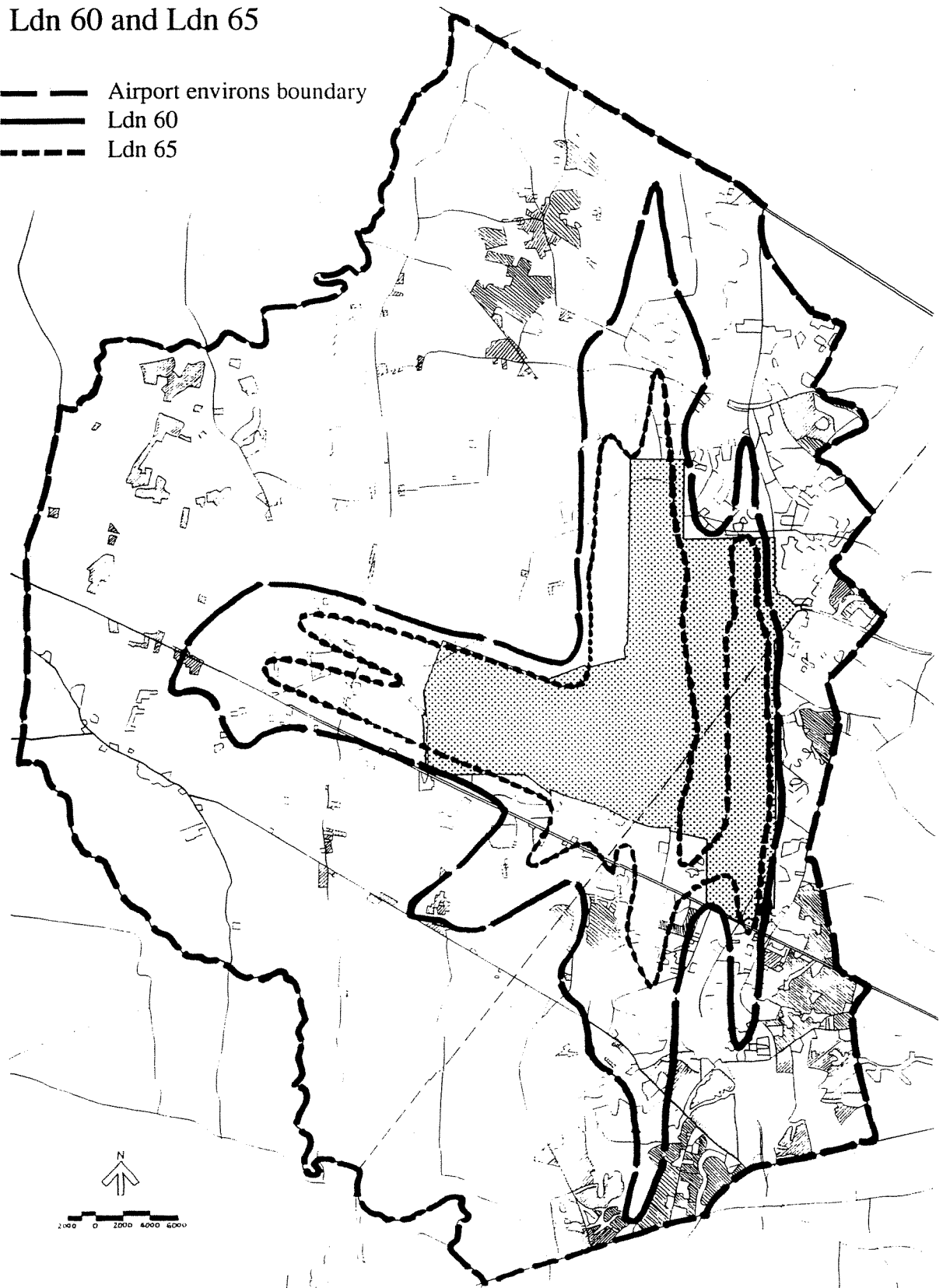
ULTIMATE AIRPORT NOISE CONTOURS 1991

FIGURE 20 A

Noise Exposure Map

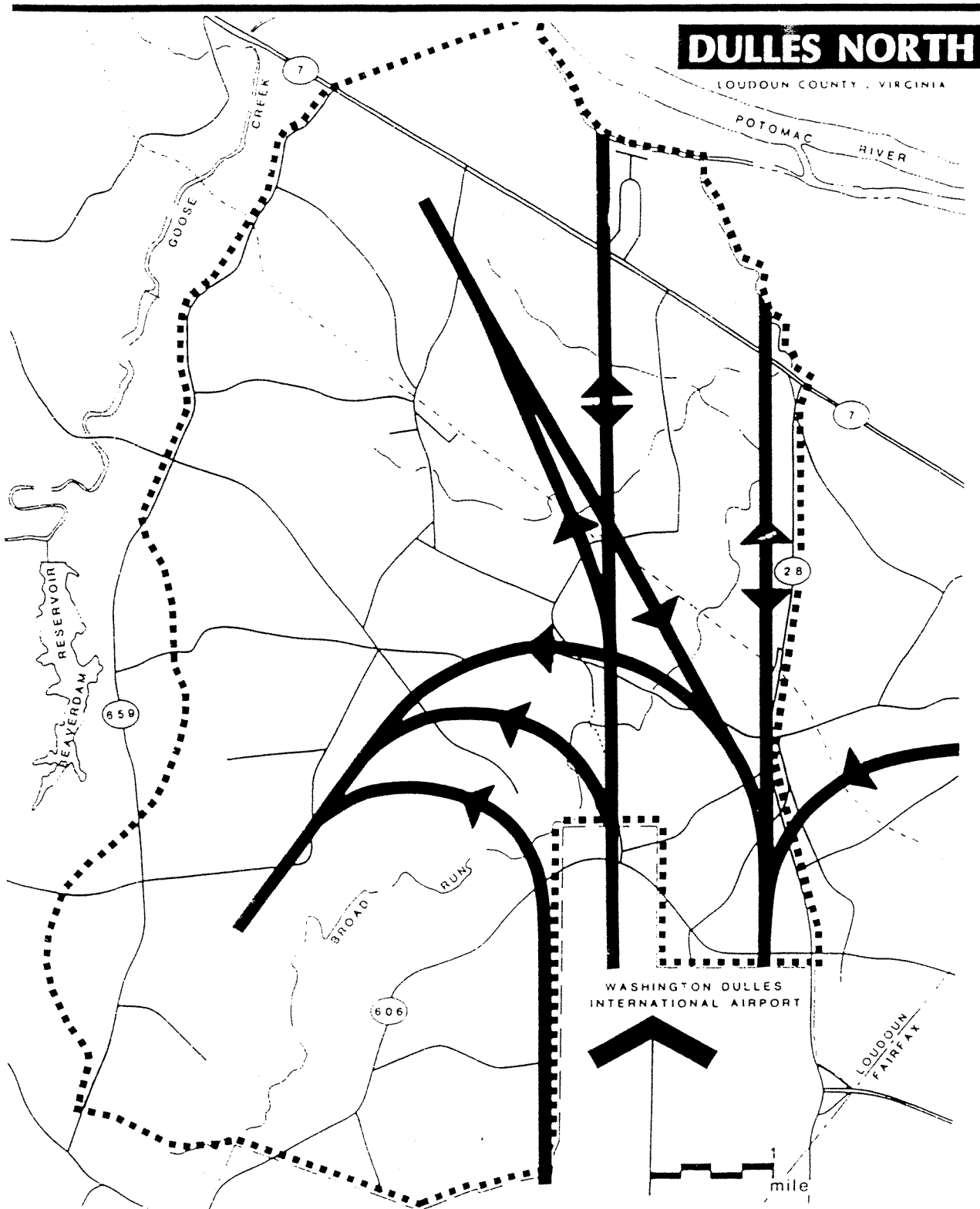
Ldn 60 and Ldn 65

- Airport environs boundary
- Ldn 60
- - - Ldn 65



ULTIMATE NOISE CONTOURS, JANUARY 1993

FIGURE 20B



AIRCRAFT FLIGHT PATHS **FIGURE 21**
OCTOBER 21, 1985

— FLIGHT PATH — ULTIMATE DEVELOPMENT OF WASHINGTON DULLES INTERNATIONAL AIRPORT
- - - - - PLANNING AREA BOUNDARY

specified in the model, and pilot judgement will alter the detailed configuration of these routes and thus the precise boundaries of the noise zones.

A 1980 Federal Interagency report on noise and community reaction to it is summarized in Table 9, page 44 which indicates that below Ldn 55, community reaction to noise is slight while a certain amount of community stress may be expected in areas subject to Ldn 55-65. Significant negative community response may be expected in areas subject to Ldn 65-70 and HUD considers such areas undesirable for residential use. Very severe community reaction may be expected in areas subject to Ldn 70-75 and HUD would only consider approval of development in such areas if there were no alternative sites available to ease a pressing housing problem.

Peat, Marwick, Mitchell and Co. consultants for the Federal Aviation Administration, have developed a noise compatibility chart based on the U.S. Department of Transportation, *"Federal Aviation Regulations, Part 150, Airport Noise Compatibility Planning."*²⁰ The standards use slightly different Ldn noise classifications from those used by the Federal Interagency group and thus Table 9, page 44, has been adjusted to reconcile the two systems. It should be noted that the consultants' table assumes that the building itself will reduce sound by 20 decibels by means of sealed windows and the installation of mechanical air handling systems. The consultants recommendation for noise level reduction components would require construction devices in addition to sealed windows and mechanical air handling. The Table further assumes that the County could obtain special enabling legislation from the Commonwealth of Virginia to implement unique deviations from the Virginia building code. Legislative experience, however, suggests that the prospect of obtaining such legislation in the near future is uncertain. Of course, little can be done to reduce sound either inside a building if windows are opened in warm weather or outside in yards and on patios. A particular land use thus ultimately becomes inappropriate for a given high ambient noise level and areas exposed to such noise should be planned for activities and uses which are not affected by high noise levels. Offices, for example, frequently have fixed windows and mechanical air systems and are not normally used as places to sleep. A quarry generates much noise by itself and would not be disturbed by overhead aircraft noise.

TABLE 9			
NOISE LEVELS AND COMMUNITY REACTION			
LDN	General Community* Attitude	Average Community** Reaction	HUD Noise*** Standards
45-55	Noise is no more important than various other factors	Slight	Acceptable. Ldn 55 is a goal for outdoors in residential areas.
55-65	At double the noise intensity of the previous category, noise may be considered an adverse aspect of the environment. 95% hearing intelligibility at 2 feet.	Moderate	Acceptable
65-70	At double the noise intensity of the previous category, noise is one of the important adverse aspects of the environment. 95% hearing intelligibility at 1.5 feet.	Significant	Discretionary ²⁴ Normally unacceptable.
70-75	At double the noise intensity of the previous category, noise is one of the most important adverse aspects of the environment. 95% hearing intelligibility at 0.9 feet.	Severe	Normally unacceptable ²⁴ <i>"should not occur as a general rule and only if less exposed sites are not available."</i>

* Federal Interagency Committee on Urban Noise, "Guidelines for Considering Noise in Land Use Planning and Control" (June 1980), Table D-1

** Ibid, Table 1.

*** The HUD Noise Regulations allow a certain flexibility for non-acoustic benefits such as existing community in-fill projects or lack of alternative sites. However, HUD will not "endorse development in the latter portion of the Discretionary - Normally unacceptable zones unless sites with less noise exposure are not available," letter from HUD to Fairfax County dated 9/20/78.

TABLE 10**SUGGESTED LAND USE COMPATIBILITY STANDARDS IN AIRCRAFT NOISE EXPOSURE AREAS²¹**

Land Use	Below Ldn 60	Ldn 60 to 65	Ldn 65 to 70	Ldn 70 to 75	Ldn 75 to 80
Residential:	Compatible (Slight community reaction to noise in the 45-55 range and moderate community reaction in the 55-60 range.)	Compatible (Noise likely to be community issue.)	Discretionary NLR Required ²² (Noise is a significant community issue.)	Normally unacceptable NLR Required (Noise a serious community issue.)	Incompatible
Public Use: Schools, hospitals, etc. Churches, auditoriums Governmental services Transportation Parking	Compatible Compatible Compatible Compatible Compatible	Compatible Compatible Compatible Compatible Compatible	NLR required NLR required Compatible Compatible Compatible	Incompatible Incompatible NLR required Compatible Compatible	Incompatible Incompatible NLR required Compatible Compatible
Commercial Use: Offices; business, and professional Wholesale and retail: building materials, hardware, farm equipment Retail trade-general Utilities Communication	Compatible Compatible Compatible Compatible Compatible	Compatible Compatible Compatible Compatible Compatible	NLR required Compatible Compatible Compatible NLR required	NLR required Compatible Compatible Compatible NLR required	NLR required Compatible Compatible Compatible NLR required
Manufacturing & production: Manufacturing: general Photographic and optical Agricultural (except livestock) and forestry Livestock farming Mining	Compatible Compatible Compatible Compatible Compatible	Compatible Compatible Compatible Compatible Compatible	Compatible Compatible Compatible Compatible Compatible	Compatible NLR required Compatible Compatible Compatible	Compatible NLR required Compatible Incompatible Compatible
Recreational: Outdoor sports arenas Outdoor amphitheaters Nature exhibits and zoos Amusements: parks, resorts, etc. Golf, riding, and water recreation	Compatible Compatible Compatible Compatible Compatible	Compatible Compatible Compatible Compatible Compatible	Compatible Incompatible Compatible Compatible Compatible	Compatible Incompatible Incompatible Compatible Compatible	Incompatible Incompatible Incompatible Incompatible Incompatible

²¹ Based on Peat, Marwick Mitchell and Co. "Air Traffic Forecasts and Preliminary Noise Exposure" (June 1983), p. 46

²² Noise level reduction.